

## Winter trips to south Van Lake and the cynipid galls on oaks (*Hymenoptera, Cynipidae*)

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**Abstract:** Winter trips to south Van Lake and the cynipid galls on oaks (*Hymenoptera, Cynipidae*). *Cesa News* 56: 1-66, 90 figures, 1 table, 22 maps.

In this paper, winter trips to South Van Lake and the cynipid oak galls with their inhabitants are narrated and illustrated. Totally 87 species of the *Cynipidae* recorded in Turkey are listed with synonyms and distributional data. Among them, 23 species are new to Van Lake basin, 2 species new to the fauna of Turkey. Other insect groups and arachnids associated with wasp galls of oaks are mentioned and their presences are discussed briefly.

**Key words:** Fauna, ecology, biology, list, Turkey, Van, Bitlis, *Hymenoptera, Cynipidae*, gallicol insects, parazitoids, predators.

On 22, 28 February, and 14 March 2010, short trips to the South of Van Lake under unfavourable conditions, made by the authors, reflect the occurrence of some cynipid oak galls (*Hymenoptera, Cynipidae, Cynipini*) in as yet unexplored region of South East Turkey (**figs. 1-14**). The aim of the field work was to observe the galls under winter condition and to have a preliminary idea for the planned 2010 autumn expeditions for the purpose of determining the gallwasp fauna of South East Turkey. The results were obtained within a short period in the area visited under the inconvenience circumstances. After an unusual long, warm winter period of East Turkey, on 22 February our first trip begun early in the morning together with the strong wind, rain and the temperature of +7 ° C. The elevation of the area visited is between 1660 and 1860m, about 70km from Van city. After a heavy but short snow storm, authors have a chance for observing and collecting some galls under the snow cover. During the following trips, the weather was also inconvenient.

The information of the six localities visited are as follows;

Locality 1 – Galls from *Quercus infectoria*. - Bitlis Province, Tatvan East, vicinity of Kağanlı village 1820m (38°21'13"N 42°41'11"E) on 22 February, 2010.

Locality 2 – Galls from *Quercus infectoria*. - at the same address, 1860m (38°21'12"N 42°42'19"E) on 22 February, 2010.

Locality 3 - Galls from *Rosa* sp. –Van Province, Edremit West, vicinity of Çiçekli, 1660m (38°24'12"N 43°12'15"E) on 22 February, 2010.

Locality 4 - Galls from *Rosa* sp. –Van Province, University Campus, 1650m (38°33'53"N 43°16'49"E), 110 males & females obtained between 1 and 18 February 2010 (all specimens in coll. Cesa) (Information from the localities 3 & 4 are added here complementarily).

Locality 5 - Galls from *Quercus brantii* and *Quercus libani*, Van Prov., Çatak, Dalbastı 1640m (37°53'57"N 42°56'50"E) on 28 February, 2010.

Locality 6 – Galls from *Quercus brantii* and *Quercus libani*, Van Prov., Çatak, Narlı bridge 1410m, (37°54'56"N 42°58'14"E) on 14 3 2010.

As result of these winter visits to the South of Van Lake, the collected cynipid galls are currently preserved in the Cesa collection and under observation for their *Hymenoptera* fauna, as well as other insects, spiders, associated with the galls usually as predators (**figs. 15-52**). During our observations in the laboratory under the room temperature (**fig. 15**), various species of *Cynipidae*, *Chalcidoidea*, *Ichneumonidae*, *Braconidae* (*Hymenoptera*), *Hemeroobiidae*, *Chrysopidae* (*Neuroptera*), *Coccinellidae*, *Melyridae* (larva & adult) (*Coleoptera*), *Chamaemyiidae* (*Diptera*), *Pammene gallicolana* (*Tortricidae*, *Lepidoptera*) were obtained. Spiders hidden among the leaves and galls under winter conditions appear as being most important predators on the rich gall fauna (**figs. 49-52**). The observed spiders are juveniles and very predacious against newly hatched insects, and other small weak spiders.

The obtained specimens are either pinned for dry insect collection (**fig. 16**), or stored in alcohol (%90) for various scientific researches (**figs. 17-18**).

Among the gall material obtained the following 22 species were identified by Dr. George Melika (Hungary). These are as follows;

*Andricus aries* (Giraud,1859) (**fig. 53**), *Andricus askewi* Melika & Stone,2001 (**figs. 54-55**), *Andricus caputmedusae* (Hartig,1843) (**fig. 56**), *Andricus insanus* (Westwood,1837) (**figs. 57-62**), *Andricus kollari* (Hartig,1843) (**figs. 23, 63**), *Andricus ligniculus* (Hartig,1840) (**figs. 25, 64**), *Andricus lucidus* (Hartig,1843) (**figs. 21, 22**), *Andricus megalucidus* Melika, Stone, Sadeghi & Pujade-Villar,2004 (**figs. 65, 66**), \**Andricus moreae* (Graeffe,1905) (**figs. 67-68**), *Andricus multiplicatus* Giraud,1859 (**figs. 24, 69-71**), *Andricus quercuscalicis* (Burgsdorf,1783) (**figs. 74-75**), *Andricus quercustozae* (Bosc,1792) (**figs. 72-73**), \**Andricus sternlichti* Bellido, Pujade-Villar & Melika,2003 (**fig. 76**), *Andricus trunciculus* (Giraud,1859) (**figs. 77-78**), *Andricus megatrunciculus* Melika,2008 (**fig. 79**), *Aphelonyx persica* Melika, Stone, Sadeghi & Pujade-Villar,2004 (**fig. 80**), *Biorhiza pallida* (Olivier,1791) (**figs. 19, 81-82**), *Cynips quercus* (Fourcroy,1785) (**figs. 83-84**), *Cynips quercusfolii* (Linnaeus,1758) (**figs. 85-87**), *Neuroterus anthracinus* (Curtis,1838) (**fig. 88**), *Neuroterus quercusbaccarum* (Linnaeus,1758) (**fig. 89**), *Diplolepis fructuum* (Rübsaamen,1895) (**figs. 26, 90**).

Within the frame of the Project “Entomofauna of Turkey”, evaluation of the literary data and the field studies of the authors are still continuing.<sup>1</sup> Of course the present numerical information reflects rather initiatory results. According to the info-system of the Cesa, the actual total number of the species recorded in Turkey with some major insect orders are given below:

	Lepidoptera	Coleoptera	Diptera	Hymenoptera	other orders	Turkey
species	<b>5204</b>	<b>3741</b>	<b>2152</b>	<b>2626</b>	<b>2493</b>	<b>16216</b>

*Cynipidae* fauna of Turkey is represented by 87 species at present (see checklist). In South East Turkey, including Van Lake basin there is no published record so far. This situation makes this region very interesting due to its unknown faunal structure. According to Zohary (1973), *Quercus brantii*, a leading species of the oak forest zone from South East Turkey (Elazığ Prov.) to

<sup>1</sup> Entomofauna projects, carried out by unique performances of the authors, cover the following major scientific activities, i.e., nomenclature, taxonomy, bibliography, database, photography, film recording, mapping, ecology, and breeding of the species. A detailed temporary report on the Entomofauna of Turkey and the Old World by the Cesa is under preparation for publication.

Zagros Mountains (env. Shiraz), extending more than a distance of 1500km. It is confined from 700-800m and 1800-1900m vertically. In Turkey, *Quercus brantii* forms a rather thin forest zone in the South East (Mardin, Diyarbakir and Bitlis Provinces) (fig.). Apparently, the northern boundary of this type of forest is the southern coastal region of the Lake Van, where *Q. brantii*, *Q. boissieri*, and *Q. libani* (fig. ) occur almost in equal proportions. Possibility of the occurrence of some recently described new cynipid species by Melika (2008) from S.W. Iran should be investigated in S. E. Turkey.

## Checklist of the Cynipidae of Turkey

The first modern list of the *Cynipidae* of Turkey was published by Katılmış & Kiyak (2008). These authors added two new species to the Turkish fauna after two years (Katılmış & Kiyak, 2009; Kiyak & Katılmış, 2010). In the last decade Askew, Gomez & Nieves-Aldrey (2004) informed an unknown cynipid species for Turkey. In the present paper, total number of the cynipid species in Turkey increased to 87. In abroad, earlier and most important works on the *Cynipidae* was published by Hartig (1840, 1841, 1843), Giraud (1859), and Dalla-Torre & Kieffer (1910). Fahringer (1930) contributed to the East Mediterranean Cynipid fauna to some degree. In the last decade, from the Mediterranean region to East Europe, West Asia, including Iran, taxonomical, ecological and faunstical studies were published by the following authors: Karimpour, Tavakoli & Melika (2008), Melika & Stone (2001), Melika, Stone, Sadeghi & Pujade-Villar (2004), Melika & Klymenko (2005), Melika (2006a, 2006b), Melika & Gharaei (2006), Melika & Karimpour (2008), Melika, Pujade-Villar, Stone, Fülop & Penzes (2009), Nazemi-Rafie, Talebi, Sadeghi & Melika (2007), Nazemi, Talebi, Sadeghi, Melika & Lozan (2008), Nieves-Aldrey & Melika (2005), Pujade-Villar, Kwast, Thuroczy & Bellido (2002), Tavakoli & Melika (2006), Tavakoli, Melika, et al. (2008), Zerova, Seryogina, Melika, G. et al. (2003).

In the checklist mentioned below, a synonymous and distributional list of the cynipid species of Turkey recorded so far. Totally 87 species are given. Synonymous scientific names are arranged chronologically. Range of each species is mentioned as codes<sup>2</sup>. Numerical codes belong to the provinces and, if known, districts of Turkey. New record for the fauna of Turkey is marked with \*. The cynipids recorded in Van Lake basin are supported with complementary maps showing the localities in the district, the provinces in Turkey, as well as the states where the species known in the World.

### *Cynipidae* Latreille, 1802 *Cynipinae* Latreille, 1802 *Cynipini* Latreille, 1802

**Andricus Hartig, 1840** Synonyms: *Andricus* Hartig, 1840; *Aphilotrix* Förster, 1869; *Liodora* Förster, 1869; *Manderstjernia* Radoskowsky, 1886; *Adleria* Rohwer & Fagan, 1917; *Euschmitzia* Dettmer, 1925; *Oncaspis* Dettmer, 1925; *Druon* Kinsey, 1937; *Femuros* Kinsey, 1937; *Feron* Kinsey, 1937; *Conobius* Kinsey, 1938

**Andricus amblycerus (Giraud, 1859)** Synonym: *amblycerus* Giraud, 1859 Range (in codes): **IT Si AT SK CZ HU UA MD RO BG GR TR**

**Andricus amenti Giraud, 1859** Synonyms: *amenti* Giraud, 1859; *giraudianus* Dalla Torre & Kieffer, 1910 Range (in codes): **ES GB FR DE AT HU IT MD BG GR TR**

**Andricus aries (Giraud, 1859)** Synonym: *aries* Giraud, 1859 Range (in codes): **GB DE IT AT SK CZ HU HV SS PL UA RO GR TR 32 65 65D 65Dn**

**Andricus askewi Melika & Stone, 2001** Synonym: *askewi* Melika & Stone, 2001 Range (in codes): **TR 61 65 65D 65Dn**

**Andricus bulgaricus Vassileva & Samnalieva, 1977** Synonym: *bulgaricus* Vassileva & Samnalieva, 1977 Range (in codes): **BG TR**

**Andricus caliciformis (Giraud, 1859)** Synonym: *caliciformis* Giraud, 1859 Range (in codes): **IT AT B-H HU YU TR RO MD UA BG**

<sup>2</sup> The special codes used in the publications of the Cesa is freely accessible: <http://www.members.tripod.com/Cesa88/Code.pdf>

**Andricus callidoma** (Hartig,1841) Synonyms: *callidoma* Hartig,1841; *cirratus* Adler,1881; *giraudi* Wachtl,1882 Range (in codes): **PT ES FR BE NL BG IE NO SE FI RU UA MD RO PL DK DE SK HU AT SS YU BG TR 15 32**

**Andricus caputmedusae** (Hartig,1843) Synonyms: *caputmedusae* Hartig,1843; *gallaecristatae* Henschel,1876 Range (in codes): **ES FR DE PL SK CZ AT SS HU B-H YU MD RO BG GR IT TR 15 32 65 65D 65Dn 65Dü**

**Andricus ceconii** Kieffer,1901 Synonym: *ceconii* Kieffer,1901 Range (in codes): **ES IT GR TR AZ Cc IL Pa IR 07 15 32**

**Andricus conglomeratus** (Giraud,1859) Synonyms: *conglomeratus* Giraud,1859; *cincta* Hartig,1879 Range (in codes): **FR IT Si DE PL UA MD HU SK CZ AT B-H BG GR TR 15 20 32**

**Andricus conificus** (Hartig,1843) Synonyms: *conificus* Hartig,1843; *longipes* Kieffer,1901; *longispinae* Kieffer,1901 Range (in codes): **IT AT HU YU RO BG UA PL TR GR IR**

**Andricus coriarius** (Hartig,1843) Synonyms: *coriarius* Hartig,1843; *lusitanicus* Kieffer,1900 Range (in codes): **PT ES FR DE IT AT SK CZ HU B-H HV YU GR BG RO UA TR TN AZ Cc IR 07 15 20 32**

**Andricus coronatus** (Giraud,1859) Synonyms: *coronatus* Giraud,1859; *coronaria* Stefani,1898 Range (in codes): **FR IT AT B-H HU GR BG RO UA TR 07 20 32 48**

**Andricus corruptrix** (Schlechtendal,1870) Synonyms: *corruptrix* Schlechtendal,1870; *ambiguus* Trotter,1899 Range (in codes): **GB FR BE NL DE DK PL UA RO BG GR YU HU SK CZ AT IT TR**

**Andricus curtisii** (Müller,1870)<sup>3</sup> Synonyms: *curtisii* Müller,1870; *mediterraneae* Trotter,1901 Range (in codes): **IT GR TR IR 07 09 20 32**

**Andricus curvator** Hartig,1840 Synonyms: *curvator* Hartig,1840; *axillaris* Hartig,1840; *collaris* Hartig,1840; *curvata* Förster,1869; *dimidiatus* Schenck,1863; *fasciatus* Schenck,1863; *perfoliatus* Schenck,1863; *tegmentorum* Schlechtendal,1870; *lusitanicus* Kieffer,1901 Range (in codes): **PT ES GB FR BE NL DE DK NO SE UA MD RO PL SK CZ HU CH AT IT SS B-H HV YU MK GR BG TR 09 15 20**

**Andricus cydoniae** Giraud,1859 Synonym: *cydoniae* Giraud,1859 Range (in codes): **GB IT Si B-H AT HU RO BG TR**

**Andricus dentimitratus** (Rejto,1887) Synonyms: *dentimitratus* Rejto,1887; *mayri* Kieffer,1897 nec Wacht.,1879; *gallaeviscosus* Benson,1953; *viscosus* Nieves-Aldrey,1986; *floridus* Melika & Csoka,1998 Range (in codes): **PT ES FR IT B-H AT HU MD RO UA BG GR TR**

**Andricus foecundatrix** (Hartig,1840) Synonyms: *foecundatrix* Hartig,1840; *gemmarum* Lacaze-Duthiers,1853; *gemmae* Schenck,1863; *foecundator* Tavares,1918 Range (in codes): **PT ES FR GB IE BE NL DE DK NO SE FI RU UA PL CZ HU AT IT SS B-H HV GR BG TR**

**Andricus galeatus** (Giraud,1859) Synonym: *galeatus* Giraud,1859 Range (in codes): **IT AT B-H YU GR BG RO HU UA TR**

**Andricus gallaeurnaeformis** (Fonscolombe,1832) Synonyms: *gallaeurnaeformis* Fonscolombe,1832; *urnaeformis* Giraud,1859; *sufflator* Mayr,1882 Range (in codes): **PT ES FR GB AT IT YU HU UA RO BG GR TR**

**Andricus gemmeus** (Giraud,1859) Synonyms: *gemmaeus* Giraud,1859; *kirchbergi* Wachtl,1876 Range (in codes): **PT ES FR DE PL AT HU IT Si B-H MD RO BG GR TR**

**Andricus glutinosus** (Giraud,1859) Synonyms: *glutinosus* Giraud,1859; *tergestensis* Kieffer,1905 Range (in codes): **AT CZ B-H HU UA BG TR**

**Andricus grossulariae** Giraud,1859 Synonyms: *grossulariae* Giraud,1859; *mayri* Wachtl,1879; *panteli* Kieffer,1897; *fructuum* Trotter,1899; *intermedius* Tavares,1922; *gemellus* Belizin & Maisuradze,1961 Range (in codes): **PT ES FR GB DE PL UA CZ AT IT Si HU MD RO YU BG GR TR 07 09 15 20 32**

**Andricus hartigi** (Hartig,1843) Synonym: *hartigi* Hartig,1843 Range (in codes): **IT Si AT CZ SK PL UA HU MD RO BG GR TR**

**Andricus hungaricus** Hartig,1943 Synonym: *hungaricus* Hartig,1943 Range (in codes): **IT AT CZ B-H HU UA RO BG TR**

**Andricus hystrix** Kieffer,1897 Synonym: *hystrix* Kieffer,1897 Range (in codes): **IT HU MD RO BG GR TR**

**Andricus infectorius** (Hartig,1843) Synonyms: *infectorius* Hartig,1843; *nostra* Kieffer,1901; *tinctorianostras* Trotter,1903 Range (in codes): **FR IT Si AT CZ SK PL HU RO YU GR TR BY 09 15 20 32 48**

**Andricus inflator** Hartig,1840 Synonyms: *inflator* Hartig,1840; *globuli* Hartig,1840; *inflatioides* Belizin & Maisuradze,1962 Range (in codes): **PT FR GB BE NL DE DK NO SE FI PL UA MD RO CZ SK HU AT CH IT SS B-H HV YU BG GR TR**

**Andricus insanus** (Westwood,1837) Synonym: *insanus* Westwood,1837 Range (in codes): **IT AL GR TR IL Pa AZ Cc IR 13 65 13G 13Gş 65D 65Dn 65Dü**

<sup>3</sup> This species was also recorded from Siirt Prov. (Şirvan, Pervari) and Diyarbakır Prov. (Kulp) during preparation this manuscript (det. Dr. Melika).

**Andricus kollari (Hartig,1843)** Synonyms: *kollari* Hartig,1843; *circulans* Mayr,1870; *indigena* Giraud,1909 Range (in codes): **PT ES FR GB BE NL DE DK PL UA RO MD CZ SK HU BG MK GR YU HV B-H SS IT TR 09 13 15 20 32 13G 13G\$**

**Andricus lignicolus (Hartig,1840)** Synonyms: *lignicolus* Hartig,1840; *vanheurni* Docters van Leeuwen & Deukhuijzen-Maasland,1958 Range (in codes): **PT ES FR GB IE BE NL DE PL UA MD RO CZ SK HU AT IT SS B-H HV YU MK BG GR TR 13? 15 20 32 13G 13G\$**

**Andricus lucidus (Hartig,1843)** Synonyms: *lucidus* Hartig,1843; *aestivalis* Giraud,1859; *lucidoserinaceus* Kieffer,1901 Range (in codes): **GB FR DE IT CZ SK AT HU B-H HV YU AL GR BG RO MD UA PL TR IR 07 13 15 20 13G 13G\$**

**Andricus malpighi (Adler,1881)** Synonyms: *malpighi* Adler,1881; *nudus* Adler,1881 Range (in codes): **ES FR GB IE BE NL DE DK HU IT BG TR**

**Andricus megalucidus Melika, Stone, Sadeghi & Pujade-Villar,2004** Synonym: *megalucidus* Melika, Stone, Sadeghi & Pujade-Villar,2004 Range (in codes): **TR IR Kd Ak Lo 15 32 65 15J 65D 65Dn**

\* **Andricus moreae (Graeffe,1905)** Synonym: *moreae* Graeffe,1905 Range (in codes): **GR TR IR 65 65D 65Dn**

**Andricus mitratus (Mayr,1870)** Synonym: *mitratus* Mayr,1870 Range (in codes): **IT AT PL UA HU RO BG GR TR**

**Andricus multiplicatus Giraud,1859** Synonym: *multiplicatus* Giraud,1859 Range (in codes): **IT Si AT CZ SK HU RO YU GR TR 65 65D 65Dn**

**Andricus megatrunciculus Melika,2008** Synonym: *megatrunciculus* Melika,2008 Range (in codes): **IR Kd Lo TR 25 65 65D 65Dü**

**Andricus polycerus (Giraud,1859)** Synonyms: *polycerus* Giraud,1859; *subterranea* Giraud,1859; *transversa* Kieffer,1897; *trinacriae* Stefani,1906 Range (in codes): **IT AT DE PL CZ SK HU RO BG GR TR 20**

**Andricus quercuscalicis (Burgsdorf,1783)** Synonyms: *quercuscalicis* Burgsdorf,1783; *calicis* Hartig,1843; *cerri* Beyerinck,1895; *beyerincki* Trotter,1899 Range (in codes): **FR GB BE NL DE DK BY EE LT UA CZ SK HU RO MD AT CH IT SS B-H HV YU MK BG GR TR 65 65D 65Dü**

**Andricus quercusradicis (Fabricius,1789)** Synonyms: *quercusradicis* Fabricius,1789; *noduli* Hartig,1840; *trilineatus* Hartig,1840; *parasiticus* Hartig,1841; *rugiscuta* Thomson,1877; *beirensis* Tavares,1902 Range (in codes): **PT ES FR GB IE DK NO SE FI PL UA MD RO HU B-H TR**

**Andricus quercuscorticis (Linnaeus,1761)** Synonyms: *quercuscorticis* Linnaeus,1761; *corticis* Hartig,1840; *brevicornis* Hartig,1841; *gemmaatus* Adler,1881; *krajnovici* Tavares,1901 Range (in codes): **PT ES FR GB IE DE DK SE PL UA MD RO HU TR**

**Andricus quercusramuli (Linnaeus,1761)** Synonyms: *quercusramuli* Linnaeus,1761; *autumnalis* Hartig,1840; *amentorum* Hartig,1843; *ramuli* Schenck,1863; *trifasciata* Kieffer,1901 Range (in codes): **PT ES FR GB IE NO SE FI BE NL DK DE PL UA AT HU ME RO TR**

**Andricus quercustozae (Bosc,1792)** Synonyms: *quercustozae* Bosc,1792; *quercustojae* Fabricius,1793; *argentea* Hartig,1843; *rosenhaueri* Hartig,1856; *kiefferi* Cabrera,1897; *tozae* Kieffer,1898 Range (in codes): **PT ES FR IT AT HU B-H HV YU AL MK BR GR RO UA TR 09 13 15 20 32 48 13G 13G\$**

**Andricus schroeckingeri Wachtl,1876** Synonym: *schroeckingeri* Wachtl,1876 Range (in codes): **AT HU RO TR**

**Andricus seckendorffi (Wachtl,1879)** Synonyms: *seckendorffi* Wachtl,1879; *magrettii* Kieffer,1897 Range (in codes): **HU AT IT GR TR IR 07 09 15 32 35**

**Andricus solitarius (Fonscolombe,1832)** Synonyms: *solitarius* Fonscolombe,1832; *ferruginea* Hartig,1840; *occultus* Tschek,1871; *filigranata* Dettmer,1925; *villarubiae* Tavares,1930 Range (in codes): **PT ES FR GB IE SE DK DE PL UA CZ SK HU MD RO AT CH IT SS B-H HV YU BG GR TR AZ Cc IR DZ 09 15**

**Andricus stefanii (Kieffer,1897)** Synonyms: *stefanii* Kieffer,1897; *#keszthelyensis* Mehes,1953 Range (in codes): **PT ES IT BG GR TR 20 32**

\* **Andricus sternlichti Bellido, Pujade-Villar & Melika,2003** Synonym: *sternlichti* Bellido, Pujade-Villar & Melika,2003 Range (in codes): **IR TR 65 65D 65Dn**

**Andricus theophrasteus Trotter,1866** Synonym: *theophrasteus* Trotter,1866 Range (in codes): **IT YU TR**

**Andricus tomentosus (Trotter,1901)** Synonym: *tomentosus* Trotter,1901 Range (in codes): **HU RO YU BG GR TR 07 20 32 48**

**Andricus trunciculus (Giraud,1859)** Synonym: *trunciculus* Giraud,1859 Range (in codes): **IT AT HU B-H YU BG RO UA PL TR 65 65D 65Dü**

***Aphelonyx* Mayr,1881** Synonym: *Aphelonyx* Mayr,1881

***Aphelonyx cerricola* (Giraud,1859)** Synonym: *cerricola* Giraud,1859 Range (in codes): **GB IT AT HU YU RO BG GR TR 09 15 20 32**

***Aphelonyx persica* Melika, Stone, Sadeghi & Pujade-Villar,2004** Synonym: *persica* Melika, Stone, Sadeghi & Pujade-Villar,2004 Range (in codes): **JO SY LB IR Kd Km TR 03 43 64 65 65D 65Dn**

***Biorhiza* Westwood,1840** Synonym: *Biorhiza* Westwood,1840

***Biorhiza pallida* (Olivier,1791)** Synonyms: *pallida* Olivier,1791; *aptera* Bosc,1791; *gallaevulariformis* Anthoine,1794; *gallaecerebriformis* Anthoine,1794; *quercusterminalis* Fabricius,1798; *terminalis* HArtig,1840; *codinae* Tavares,1928; *hispanica* Tavares,1928; *lusitanica* Tavares,1928 Range (in codes): **PT ES FR GB IE BE NL DE DK NO SE FI RU PL UA MD RO HU SK CZ SS B-H HV YU MK BG GR AT IT TR 13 15 20 32 13G 13G\$**

***Callirhytis* Förster,1868** Synonym: *Callirhytis* Förster,1868

***Callirhytis rufescens* (Mayr,1882)** Synonyms: *rufescens* Mayr,1882; *villarrubiae* Tavares,1930; *glandulosa* Weld,1930 Range (in codes): **PT ES FR HU GR TR**

***Callirhytis glandium* (Giraud,1859)** Synonyms: *glandium* Giraud,1859; *girardi* Tavares,1902; *aestivalis* Nieves-Aldrey,1992 Range (in codes): **PT ES FR GB IT AT B-H HU RO PL UA TR**

***Chilaspis* Mayr,1881** Synonym: *Chilaspis* Mayr,1881

***Chilaspis nitida* (Giraud,1859)** Synonyms: *nitida* Giraud,1859; *loewii* Wachtl,1882 Range (in codes): **AT DE RO HU BG TR**

***Chilaspis mayri* (Müllner,1901)** Synonym: *mayri* Müllner,1901 Range (in codes): **AT GR HU IL Pa TR**

***Cynips* Linnaeus,1758** Synonyms: *Cynips* Linnaeus,1758; *Dryophanta* Förster,1869

***Cynips agama* Hartig,1840** Synonyms: *agama* Hartig,1840; *mailleti* Folliot,1964 Range (in codes): **ES FR GB IE BE DE AT PL UA HU B-H BG TR 15**

***Cynips cornifex* Hartig,1843** Synonym: *cornifex* Hartig,1843 **IT AT SS HU RO BG GR TR**

***Cynips divisa* Hartig,1840** Synonyms: *divisa* Hartig,1840; *verrucosus* Schlechtendal,1870 Range (in codes): **PT ES FR GB IE BE NL DE DK SE FI RU UA MD RO YU HV SS GR IT Si AT CZ SK HU TR**

***Cynips quercus* (Fourcroy,1785)** Synonyms: *quercus* Fourcroy,1785; *pubescens* Mayr,1881; *ilicis* Kieffer,1896; *geminus* Belizin & Maisuradze,1962; *rusanova* Belizin & Maisuradze,1962 Range (in codes): **PT ES FR DE UA MD RO YU GR IT AT HU TR MK 09 20 32 65 65D 65Dn**

***Cynips quercusfolii* (Linnaeus,1758)** Synonyms: *quercusfolii* Linnaeus,1758; *scutellaris* Olivier,1791; *gallaecerasiformis* Anthoine,1794; *gallaenudoniformis* Anthoine,1794; *folii* Hartig,1840; *flosculi* Giraud,1868; *giraudi* Tschek,1869; *taschenbergi* Schlechtendal,1870 Range (in codes): **ES FR GB IE BE NL DE DK NO SE FI EE RU CH IT AT CZ SK HU PL UA MD RO BG MK GR YU HV B-H SS TR 07 09 13 15 20 32 48 65 13G 13G\$ 65D 65Dn**

***Dryocosmus* Giraud,1859** Synonyms: *Dryocosmus* Giraud,1859; *Entropha* Förster,1869

***Dryocosmus cerriphilus* Giraud,1859** Synonym: *cerriphilus* Giraud,1859 Range (in codes): **IT AT HU RO TR 24**

***Neuroterus* Hartig,1840** Synonyms: *Neuroterus* Hartig,1840; *Spathegaster* Hartig,1840; *Ameristus* Förster,1869; *Dolichostrophus* Ashmead,1887; *Neospathegaster* Kinsey,1923; *Diplobius* Kinsey,1923

***Neuroterus albipes* (Schenck,1863)** Synonyms: *albipes* Schenck,1863; *laeviusculus* Schenck,1863; *pezizaeformis* Schlechtendal,1870; *lusitanicus* Tavares,1902; *codinae* Tavares,1928 Range (in codes): **PT ES FR GB IE DK SE NO RU DE PL CZ HU UA RO MD BG YU B-H SS AT TR**

***Neuroterus anthracinus* (Curtis,1838)** Synonyms: *anthracinus* Curtis,1838; *ostreus* Giraud,1859; *ostria* Hartig,1840; *pallicornis* Hartig,1840; *furunculus* Bayerinck,1882 Range (in codes): **PT ES FR BE NL GB IE NO SE EE RU UA PL DE DK CZ SK HU MD RO BG MK GR YU HV B-H SS AT IT TR 65 65D 65Dn**

***Neuroterus lanuginosus* Giraud,1859** Synonym: *lanuginosus* Giraud,1859 Range (in codes): **GB AT IT Si BG B-H GR HU RO YU IL Pa TR Cc AZ GG IR Gh Elb Th Lo Kd Fa SY 09 15 20 32**

***Neuroterus minutulus* Giraud,1859** Synonym: *minutulus* Giraud,1859 Range (in codes): **IT AT HU RO BG TR**

***Neuroterus numismalis* (Fourcroy,1785)** Synonyms: *numismalis* Fourcroy,1785; *reaumurii* Hartig,1840; *defectus* Hartig,1840; *quercustiarae* Curtis,1843; *vesicatrix* Schlechtendal,1870; *vesicator* Hieronymus,1890; *brunneus* Dettmer,1925 Range (in codes): **PT ES FR BE NL GB IE NO SE UA PL DE DK CZ SK HU MD RO BG MK GR YU HV B-H SS AT CH IT TR 07 09 15 20 32**

***Neuroterus politus* Hartig,1840** Synonyms: *politus* Hartig,1840; *petioliventris* Hartig,1840; *nitens* Hartig,1841; *bipunctatus* Hartig,1841; *rubeculus* Hartig,1841; *apriliinus* Giraud,1859; *burgundus* Schlechtendal,1870; *schlechtendali* Mayr,1870 Range (in codes): **PT ES FR NL GB IE SE UA PL DE HU MD RO BG YU AT IT TR**

***Neuroterus quercusbaccarum* (Linnaeus,1758)** Synonyms: *quercusbaccarum* Linnaeus,1758; *baccarumquercus* Fourcroy,1785; *flavipes* Fourcroy,1785; *pedunculiquercus* Fourcroy,1785; *lenticularis* Olivier,1791; *longipennis* Fabricius,1793; *gallaelenticulatae* Anthoine,1794; *malpighii* Hartig,1840; *interruptor* Hartig,1841; *interruptrix* Hartig,1841; *baccarum* Blanchard,1849; *pedunculi* Dumeril,1860; *striatus* Schenck,1863; *attenuatus* Schenck,1863; *giraudi* Tschek,1869; *histrio* Kieffer,1901; *hispanicus* Tavares,1916; *intermedius* Tavares,1916 Range (in codes): **PT ES FR BE NL GB IE NO SE FI EE UA PL DE DK CZ SK HU MD RO BG MK GR RU YU HV B-H SS AT CH IT TR 09 15 32 65 65D 65Dn**

***Neuroterus tricolor* Hartig,1841** Synonyms: *tricolor* Hartig,1841; *fumipennis* Hartig,1841; *varius* Schenck,1863; *ulisippore* Tavares,1928 Range (in codes): **PT ES FR BE NL GB IE NO SE FI EE UA PL DE DK SK HU MD RO BG MK GR RU YU HV SS AT CH IT TR**

***Plagiotrochus* Mayr,1881** Synonyms: *Plagiotrochus* Mayr,1881; *Fioria* Kieffer,1903 nec *Silvestri*,1898; *Fioriella* Kieffer,1903

***Plagiotrochus quercusilicis* (Fabricius,1798)** Synonyms: *quercusilicis* Fabricius,1798; *cocciferae* Lichtenstein,1877; *ilicis* Lichtenstein,1877; *emereyi* Mayr,1882; *fusifex* Mayr,1882; *kiefferi* Dalla & Torre & Kieffer,1910; *niger* Dalla & Torre & Kieffer,1910; *lichtensteinii* Dalla & Torre & Kieffer,1910; *lusitanicus* Tavares,1926 Range (in codes): **PT ES FR IT TR 20**

***Pseudoneuroterus* Kinsey,1923** Synonym: *Pseudoneuroterus* Kinsey,1923

***Pseudoneuroterus macropterus* (Hartig,1843)** Synonym: *macropterus* Hartig,1843 Range (in codes): **IT AT B-H HU RO BG GR TR 09 20**

***Aulacidea* Ashmead,1897** Synonym: *Aulacidea* Ashmead,1897

***Aulacidea acroptilonica* Tyurebaev,1979** Synonym: *acroptilonica* Tyurebaev,1979 Range (in codes): **TR IR AB Oru UA RU KG KK TM TJ UZ**

***Trigonaspis* Hartig,1840** Synonym: *Trigonaspis* Hartig,1840

***Trigonaspis synaspis* (Hartig,1841)** Synonyms: *synaspis* Hartig,1841; *megapteropsis* Wriese,1900 Range (in codes): **PT ES DE PL UA MD RO HU AT IT TR**

### ***Synergini* Ashmead,1896**

***Synergus* Hartig,1840** Synonyms: *Synergus* Hartig,1840; *Sapholytus* Förster,1869

***Synergus pallicornis* Hartig,1841** Synonyms: *pallicornis* Hartig,1841; *pallidicornis* Dalla Torre,1893 Range (in codes): **PT ES FR GB NL DE DK SE PL UA RO HU AT CH IT B-H TR**

***Synophrus* Hartig,1843** Synonym: *Synophrus* Hartig,1843

***Synophrus politus* Hartig,1843** Synonym: *politus* Hartig,1843 Range (in codes): **PT ES IT Si AT CZ HU B-H HV YU RO BG GR TR**

### ***Aylacini* Ashmead,1903**

***Aylax* Hartig,1840** Synonyms: *Aylax* Hartig,1840; *#Aulax* Hartig,1843

**Aylax hypocoii** Trotter, 1913 Synonyms: *hypocoii* Trotter, 1913; *spirorhynchusii* Diakontshuk, 1990  
Range (in codes): **DZ LY BG GR TR Cc AM TM**

**Liposthenes** Förster, 1868 Synonym: *Liposthenes* Förster, 1868

**Liposthenes kernerii** (Wachtl, 1891) Synonym: *kernerii* Wachtl, 1891 Range (in codes): **ES IT AT HU  
RO UA RU TR**

### **Diplolepidini** Latreille, 1802

**Diplolepis** Goeffroy, 1762 Synonyms: *Diplolepis* Goeffroy, 1762; *Rhodites* Hartig, 1840; *Tribalia* Walsh, 1864; *Hololexis* Förster, 1869; *Lytorhodites* Kieffer, 1902

**Diplolepis eglanteriae** (Hartig, 1840) Synonyms: *eglanteriae* Hartig, 1840; *rufipes* Forster, 1869  
Range (in codes): **PT ES FR GB NL DE SE PL AT HU RO IT TR**

**Diplolepis fructuum** (Rübsaamen, 1895) Synonym: *fructuum* Rübsaamen, 1895 Range (in codes): **TR GG Tbl Cc UA Cm 65 65K 65L 65Lc 65D 65Dj**

**Diplolepis mayri** (Schlechtendal, 1877) Synonyms: *mayri* Schlechtendal, 1877; *orthopsinae* Beijerinck, 1882 Range (in codes): **ES PT FR GB NL DE SE PL AT IT TR GG Cc Tbl Bjo**

**Diplolepis rosae** (Linnaeus, 1758) Synonyms: *rosae* Linnaeus, 1758; *bedeguaris* Fourcroy, 1785  
Range (in codes): **PT ES GB NL DE PL SE AT HU RO IT TR**

**Diplolepis spinosissimae** (Giraud, 1859) Synonym: *spinosissimae* Giraud, 1859 Range (in codes): **ES FR GB NL DE AT HU PL SE IT TR**

The results obtained from this survey can be briefly evaluated as follows:

The *Cynipidae* fauna of Turkey is very little known so far. The total species should be more than 100. Most of the species is known only from a few provinces in Turkey (see checklist and maps). The 87 species of Turkey are represented in 17 genera of 4 tribes. Among them, the tribe *Cynipini* is the richest group with 12 genera and 78 species. The genus *Andricus* is the richest one among them, by representing 53 species in Turkey. In the present paper, *Andricus* is represented by 16 species in the region. As the trips were made under very inconvenient conditions in winter, the results obtained should be accepted satisfactory for the time being, and hopeful for the future. On the other hand, very interesting records among the gall inhabitants were made during this investigation. In the table 1, a number of species of various families of 5 insect and 2 arachnid orders, associated with the wasp galls are evaluated.

**Table 1** – Evaluation of the inhabitants associated with the galls mainly *Andricus* spp. in Van Lake basin (\* new to province)

Ordo	family	Species	related galls	Remarks
Hemiptera	Anthocoridae	Unidentified (figs. 39-40)	<i>Andricus multiplicatus</i>	gallicol species probably predator
	Tingidae	Unidentified (fig. 41)	<i>Andricus multiplicatus</i>	gallicol species
	Miridae	<i>Geocoris</i> sp. *	<i>Andricus multiplicatus</i>	gallicol species
Neuroptera	Hemerobiidae	unidentified sp.1 (fig. 37)	<i>Andricus multiplicatus</i>	gallicol species
		unidentified sp.2 (figs. 35-36)	<i>Andricus kollari</i>	gallicol species
	Chrysopidae	unidentified larva (fig. 38)	<i>Andricus multiplicatus</i>	gallicol species
Diptera	Chamaemyiidae	<i>Leucopis</i> sp. (figs. 33, 34)	<i>Aphelonyx persica</i>	gallicol species but predator on aphids
Coleoptera	Coccinellidae	<i>Bulaea lichatschovi</i> * (fig. 42)	<i>Andricus megalucidus</i>	gallicol species
		<i>Harmonia axyridis</i> * (fig. 43)	<i>Andricus multiplicatus</i>	gallicol species
	Melyridae	<i>Cyrtosus</i> sp. * (figs. 44-46)	<i>Andricus kollari</i> , <i>A. caputmedusae</i> , <i>A. megalucidus</i>	gallicol species, larva predator
Lepidoptera	Tortricidae	<i>Pammene gallicolana</i> * (fig. 47)	<i>Andricus multiplicatus</i> and <i>A. moreae</i> . Another specimen obtained from	Previously known gall species for this moth was <i>Biorhiza pallida</i> .

			<i>Aceria salicina</i> galls ( <i>Eriophyidae, Acarina</i> ) <sup>4</sup>	<i>Andricus</i> and <i>Aceria</i> records are new to science!
	<i>Tineidae</i>	<i>Nemapogoninae</i> sp.	<i>Andricus multiplicatus</i>	larvae on fungi, probably developed in old galls
<i>Hymenoptera</i>	<i>Cynipidae</i>	<i>Andricus</i> spp. (15)  Adults are as follows:  <i>Andricus kollari</i> (fig. 23) <i>A. multiplicatus</i> (fig. 24) <i>A. lucidus</i> (figs. 21-22) <i>Synergus</i> sp. (figs. 23, 25) <i>Diplolepis fructuum</i> (fig. 26)	<i>Andricus</i> spp. (15)	Several adults were obtained from usually very old galls.
	<i>Chalcidoid</i> families (figs. 16, 20, 27-31) <i>Torymidae,</i> <i>Eurytomidae</i> etc.	various species		known as parazitoids on cynipids
	<i>Ichneumonidae</i>	unidentified spp. (figs. 17, 19, 32)		known as parazitoids on <i>Lepidoptera</i>
	<i>Braconidae</i>	unidentified sp. (fig. 24)		known as parazitoids on <i>Lepidoptera</i>
<i>Araneida</i>	various families ( <i>Araneidae,</i> <i>Salticidae,</i> <i>Philodromidae</i> etc.)	<i>Araniella</i> sp. (fig. 50), <i>Philodromus</i> sp. (fig. 51), salticid. spp. (figs. 49, 52)	<i>Andricus</i> spp.	predators on all other inhabitants of the galls
<i>Acarina</i>	<i>Tetranychidae</i>	<i>Tetranychus</i> sp.	<i>Andricus kollari</i> on <i>Quercus libani</i>	its presence unknown.

In conclusion, taking the conditions from this winter survey it can be said that the further studies on the *Cynipidae* fauna of East Turkey is inevitable task from the scientific standpoint. From the standpoint of the ongoing Project Entomofauna of Turkey, the determining the particular fauna of the galls is also very important from the biological and ecological aspects. Especially the galls of *Andricus multiplicatus*, and *Biorhiza pallida* seem to be richer in gallicol species than the other relatives.

This unique study, nearly one-month-survey, reflects a good collaborative research together with Dr. Melika and produces great hopes for the future.

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<sup>4</sup> *Aceria salicina* was determined by Dr. Evsel Denizhan (Yüzüncü Yıl University, Faculty of Agriculture, Van, Turkey).

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### **Illustrations of the field studies**



**Fig. 1** – Under winter condition, first trip to Kağanlı, Tatvan distr., Bitlis Province, 22 Febr., 2010 photo M.Kemal (Cesa)



**Fig. 2** – Under winter condition, first trip to Kağanlı, Tatvan distr., Bitlis Province, 22 Febr., 2010 photo M.Kemal (Cesa)



**Fig. 3** – First trip to Kağanlı. Vicinity Kuzgunkiran pass (2250m), Van/ Bitlis Provinces, 22 Febr.,2010 photo M.Kemal (Cesa)



**Fig. 4** – First trip to Kağanlı. Vicinity Kağanlı (2100m), Tatvan, Bitlis Provinces, 22 Febr.,2010 photo M.Kemal (Cesa)



**Fig. 5** – Oakland, Kağanlı (2060m), Tatvan, Bitlis Provinces, 22 Febr., 2010, first autor who collected the galls. photo A.O.Koçak (Cesa)



**Fig. 6** – Oakland, Kağanlı (2060m), Tatvan, Bitlis Provinces, 22 Febr., 2010, first autor who collected the galls. photo A.O.Koçak (Cesa)



**Fig. 7** - Çatak Dalbastı road in winter, Turkey, Van Prov., 28 2 2010 photo M.Kemal (Cesa)



**Fig. 8** - Dalbastı oakland 1650m, Turkey Van Prov. Çatak, 28 February 2010, photo A.Ö.Koçak (Cesa)



**Fig. 9-** Oak branches and trees cut down by local people for firewood. Destructions of oaklands in South East Turkey is extremely high in last decades. Photo M. Kemal (Cesa)



**Figs.10, 11 -** Tree trunks. *Quercus brantii* (left), *Quercus libani* (right) at Dalbastı (Çatak). These two species can also be identified by their trunk structure. Photo M. Kemal (Cesa)



**Fig. 12** - A *Corydalis* species (Fumariaceae) grown nearby a cut down tree at Dalbastı (Çatak). This is an important food-plant of an endangered butterfly species *Parnassius mnemosyne* (Papilionidae). Photo M. Kemal (Cesa)



**Fig. 13** - At Dalbastı (Çatak), during photographing the mycetophilid flies living around decaying debris at the bottom of oaks. Photo A.Ö.Koçak (Cesa)



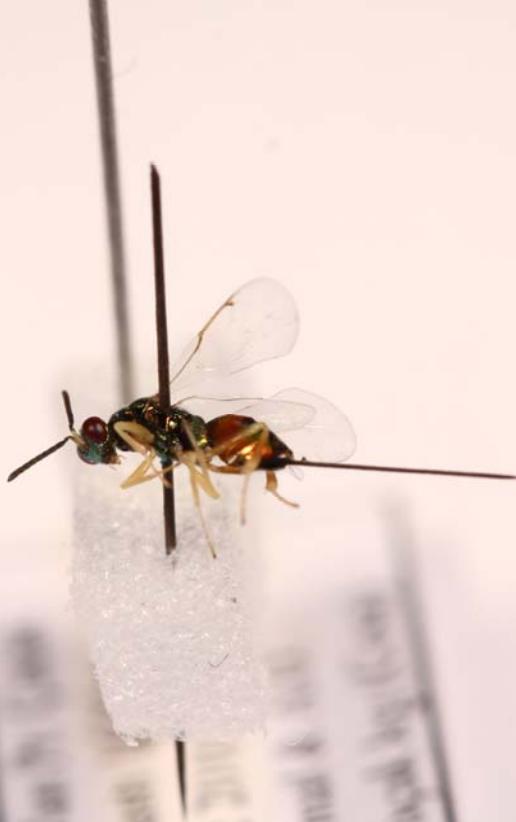
**Fig. 14** - Third author from Çatak Dalbastı (Van Prov.) during field studies. Photo MKemal (Cesa)



## Illustrations of the gall insects and other predators



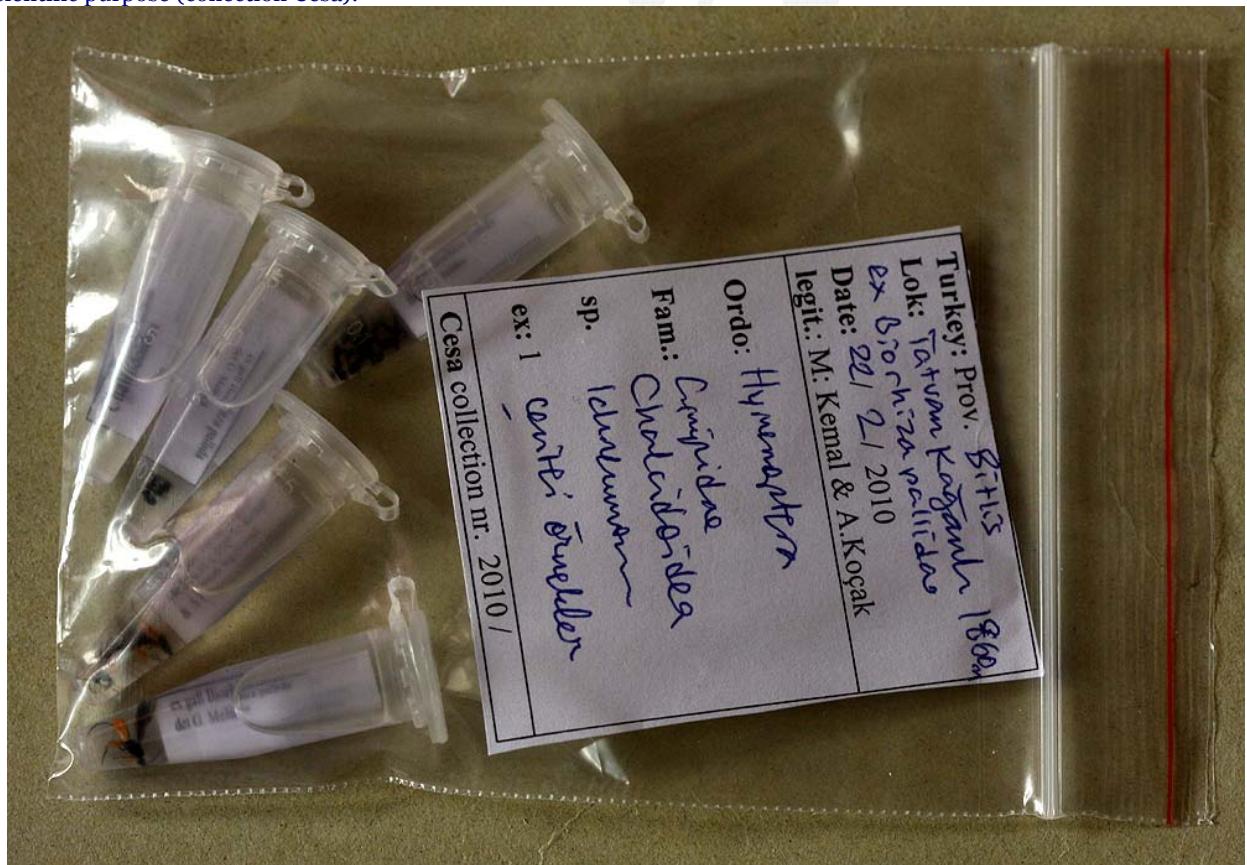
**Fig. 15** – Gall breeding laboratory, 25 3 2010. For daily observation the gall inhabitants, emerging from dried and older galls, transparent boxes (20 x 15 x 7 cm) are used. Photo A.Ö.Koçak (Cesa)



**Fig. 16** - Specimen obtained from a gall breeding box is pinned and labelled properly for the dry insect collection of the Cesa (illustrated female is a *Torymus* sp. (*Torymidae*)).



**Fig. 17** - An ichneumonid specimen obtained from a gall breeding box is also stored in alcohol %90 with label for scientific purpose (collection Cesa).



**Fig. 18** - Unidentified specimens obtained from a gall breeding box are stored temporarily in alcohol %90 with labels for further investigations (collection Cesa).



**Fig. 19** - A female of Ichneumonid wasp (Pimplinae), parasites usually small moths like *Pammene gallicola* (Tortricidae) living in *Biorhiza pallida* galls (Cynipidae). This wasp obtained from *Biorhiza pallida* gall. Turkey Bitlis Prov., Tatvan Kağanlı 1865m, hatched on 19 3 2010 (collected on 22 2 2010), photo M. Kemal (Cesa)



**Fig. 20** - A chalcidoid parazitoid obtained on 12 3 2010 from the gall of *Biorhiza pallida* (Cynipidae). Turkey Bitlis Prov., Tatvan, Kağanlı 1865m, collected on 22 2 2010, photo M. Kemal (Cesa)



**Fig. 21** - *Andricus lucidus* (Cynipidae) obtained from its gall, and emerged on 23 2010. Turkey Bitlis Prov., Tatvan, Kağanlı 1860m (collected 22 2 2010) photo M Kemal (Cesa)



**Fig. 22** - *Andricus lucidus* (Cynipidae) obtained from its gall, and emerged on 23 2010. Turkey Bitlis Prov., Tatvan, Kağanlı 1860m (collected 22 2 2010) M Kemal leg & photo Cesa



**Fig. 23** – *Synergus* sp. (Cynipidae), a cynipid inquiline, feeding on the gall parenchima. Turkey Bitlis Prov., Tatvan, Kağanlı 1860m, collected 22 2 2010, photo M Kemal (Cesa)



**Fig. 24** – A braconid wasp emerged from a gall of *Andricus multiplicatus* (Cynipidae) obtained on 28 3 2010. Probably emerged from Lepidopteran larva found in overwintering galls. Turkey Van Prov., Çatak Narlı bridge 1410m (collected on 14 3 2010), photo M Kemal (Cesa)



**Fig. 25** - *Synergus* sp. (Cynipidae), a cynipid inquiline, feeding on the gall parenchima of *Andricus ligniculus* (Cynipidae). Turkey, Bitlis Prov., Tatvan, Kağanlı 1865m 22 2 2010 photo M. Kemal (Cesa)



**Fig. 26** - *Diplolepis fructuum* (Cynipidae) obtained from its gall. Turkey, Van Prov. Edremit, Çiçekli 1660m 22 2 2010 photo M Kemal (Cesa)



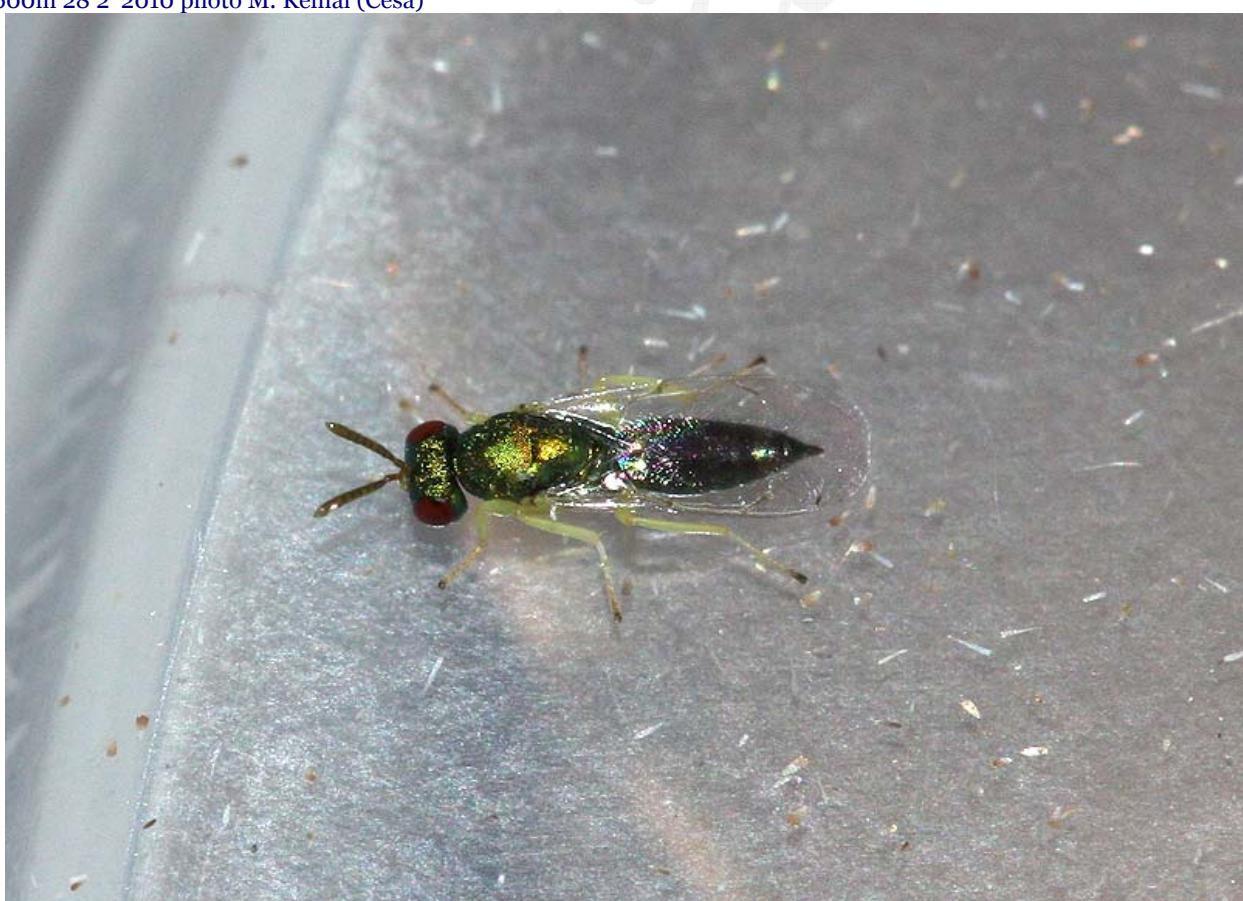
**Fig. 27** - *Sycophila biguttata* (Eurytomidae), a chalcidoid parazitoid obtained from gall of *Andricus quercustozae*. Turkey Bitlis Prov., Tatvan, Kağanlı 1860m (collected 22 2 2010) M Kemal leg & photo Cesa)



**Fig. 28** - A torymid wasp, obtained from *Andricus moreae* (Cynipidae). Turkey Van Prov. Çatak Dalbastı 1650m 28 2 2010 photo M Kemal (Cesa)



**Fig. 29** – A chalcidid wasp obtained from *Neuroterus quercusbaccarum* (Cynipidae) Turkey Van Prov., Çatak Dalbastı 1600m 28 2 2010 photo M. Kemal (Cesa)



**Fig. 30** – A pteromalid parasitoid (Chalcidoidea) obtained from *Neuroterus quercusbaccarum* (Cynipidae) Turkey Van Prov., Çatak Dalbastı 1600m 28 2 2010 photo M. Kemal (Cesa)



**Fig. 31** - A *Torymus* female (Torymidae, Chalcidoidea) obtained from *Cynips quercusfolii* (Cynipidae). Turkey Van Prov. Dalbastı 1600m 28.2.2010 M.Kemal leg. & photo (Cesa).



**Fig. 32** - An ichneumonid wasp obtained from gall of *Andricus multiplicatus*. A parasite on gallicol Lepidopteran larvae. Turkey, Çatak Dalbastı 1650m 28.2.2010 M.Kemal photo (Cesa)



**Fig. 33** - A fly, *Leucopis* sp. (*Chamaemyiidae*) obtained from *Quercus libani* with the gall *Aphelonyx persica* (*Cynipidae*). This fly is known as predator on aphids. Explaining the association with a gall in captivity is not easy. Mr. Gaimari comments "its emergence from a cynipid gall would only be right if there were aphids in the gall" (through forum of Diptera.info- 12.3.2010). Turkey, Van Prov. Çatak Dalbastı 1600m 28 2 2010 M.Kemal (Cesa).



**Fig. 34** - *Leucopis* sp. (*Chamaemyiidae*) obtained from *Quercus libani* with the gall *Aphelonyx persica* (*Cynipidae*) (det. Mr. Steve Gaimari). Turkey, Van Prov., Çatak Dalbastı 1600m 28 2 2010 M.Kemal (Cesa).



**Fig. 35** – An hemerobiid species (Neuroptera). Newly hatched specimen from *Andricus kollari* gall. Turkey Van Prov., Çatak, Narlı bridge 1410m (collected on 14 3 2010, hatched on 25 3 2010). Photo M. Kemal (Cesa)



**Fig. 36** – Same species mentioned above (Neuroptera), fully coloured. Photo M. Kemal (Cesa)



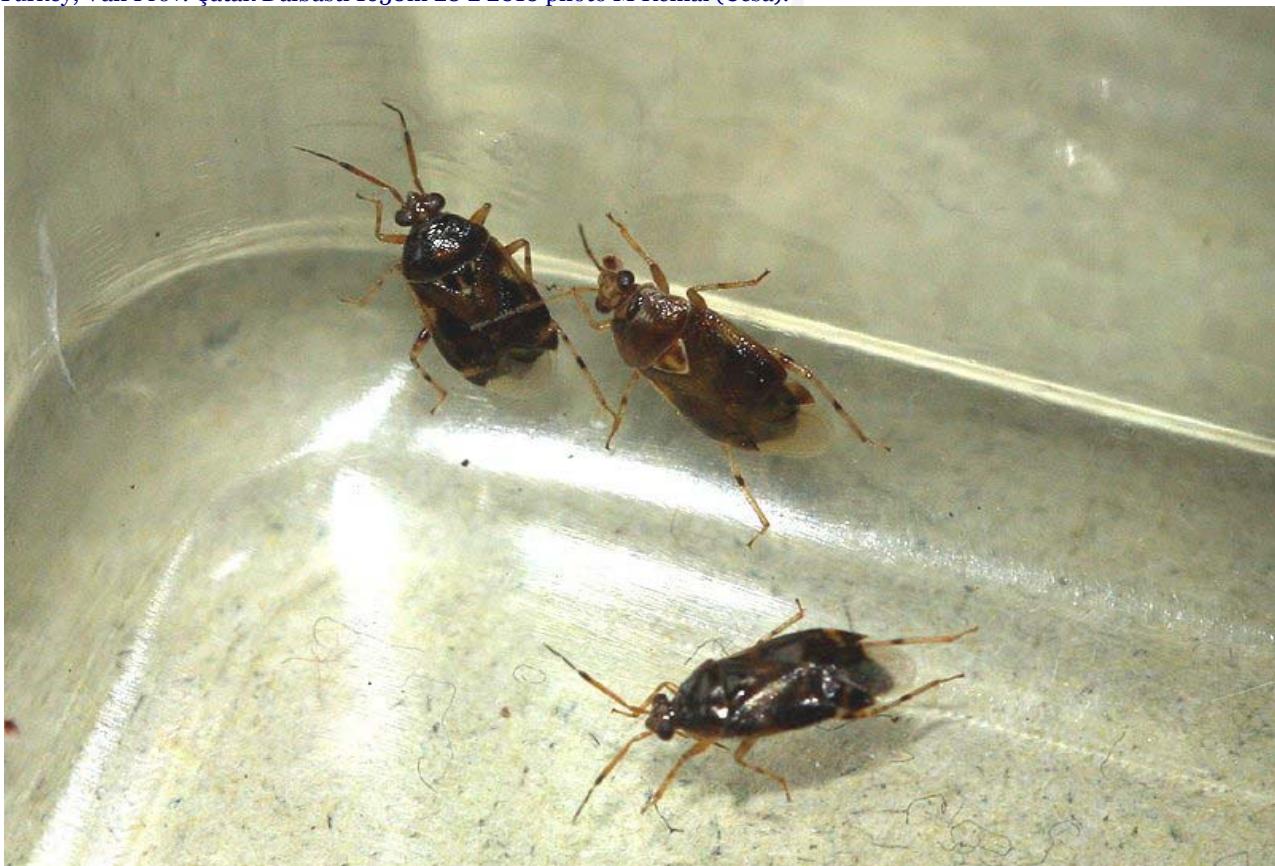
**Fig. 37** – Another hemerobiid species (Neuroptera), emerged from *Andricus multiplicatus* gall. Turkey Van Prov., Çatak, Narlı bridge 1410m (collected on 14 3 2010, hatched on 22 3 2010). Photo M. Kemal (Cesa)



**Fig. 38** - A chrysopid larva obtained from *Quercus* with galls. Apparently a gallicol species. Turkey Van Prov., Çatak Narlı bridge 1410m, 14 3 2010 M. Kemal photo (Cesa)



**Fig. 39** - An anthocorid species (Hemiptera) obtained from *Quercus libani* with *Andricus multiplicatus* (Cynipidae). Turkey, Van Prov. Çatak Dalbastı 1650m 28 2 2010 photo M Kemal (Cesa).



**Fig. 40** - An anthocorid species (Hemiptera) obtained from *Quercus libani* with *Andricus multiplicatus* (Cynipidae). Turkey, Van Prov. Çatak Dalbastı 1650m 28 2 2010 photo M Kemal (Cesa).



**Fig. 41** – A tingid species (Hemiptera) obtained from gall of *Andricus multiplicatus* on 28 3 2010. Turkey Van Prov., Çatak Narh bridge 1410m (collected on 14 3 2010), photo M Kemal (Cesa)



**Fig. 42** – *Bulaea lichatschovi* (Coccinellidae) obtained from gall of *Andricus megalucidus* (Cynipidae) Turkey Van Prov. Çatak Dalbastı 1600m 28 2 2010, photo M. Kemal (Cesa)



**Fig. 43** – An invasive ladybird, *Harmonia axyridis* (Coccinellidae) obtained from *Quercus*, with *Andricus multiplicatus* gall. Turkey Van Prov., Çatak Narlı bridge 1410m, 14 3 2010 M.Kemal photo (Cesa)



**Fig. 44** - A bettle obtained from *Andricus kollaris* (Cynipidae). This might be a *Cyrtosus* larva (Melyridae). Turkey Bitlis Prov. Tatvan Kağanlı 1860m 22 2 2010, photo M.Kemal (Cesa).



**Fig. 45** - Same beetle larva from *Andricus kollaris* (Cynipidae). This might be a *Cyrtosus* larva (Melyridae). Turkey Bitlis Prov. Tatvan Kağanlı 1860m 22 2 2010, photo M.Kemal (Cesa).



**Fig. 46** - A melyrid specimen (3-4mm) obtained from *Andricus caputmedusae* (Cynipidae). Another specimen obtained from *Andricus megalucidus* at the same place. Dr. Svhla kindly informed us that it is a *Cyrtosus* species. Turkey Van Prov. Çatak Dalbastı 1600m 28 2 2010, photo M.Kemal (Cesa).



**Fig. 47** - *Pammene gallicolana* (Tortricidae) emerged on 15 3 2010 from gall of *Andricus multiplicatus* (Cynipidae). Turkey Van Prov., Çatak, Dalbastı 1600m, Photo M. Kemal (Cesa)



**Fig. 48** – A noctuid (Lepidoptera) egg laid on the gall of *Andricus trunciculus* (Cynipidae). Turkey Van Prov., Çatak, Narlı bridge 1410m 14 3 2010 Photo M. Kemal (Cesa)



**Fig. 49** – A salticid spider obtained from gall of *Andricus caputmedusae* (Cynipidae). Turkey Van Prov., Çatak, Dalbastı 1600m, 28 2 2010, Photo M. Kemal (Cesa)



**Fig. 50** - A spider (Araniella sp., Araneidae) from *Quercus infectoria* with galls. This is also an important predator on the gall insects (det. Jorgemotalmeida). Turkey Bitlis Prov. Tatvan Kağanlı 1860m 22 2 2010, photo M.Kemal (Cesa).



**Fig. 51** - Spiders can hunt other weak spiders (*Philodromus* sp., *Philodromidae*) (det. Nielsyese) from *Quercus libani* with galls. Turkey Van Prov., Çatak Dalbastı 1650m 28 2 2010, photo M.Kemal (Cesa).



**Fig. 52** - A salticid species on the gall of *Andricus kollaris* (Cynipidae). Turkey Van Prov., Çatak Dalbastı 1650m 28 2 2010, photo M.Kemal (Cesa).

## Illustrations of the wasp galls in South of Van Lake



**Fig. 53** - *Andricus aries* (Cynipidae) gall. Turkey Van Prov., Çatak Dalbastı 1600m 28 2 2010 photo M. Kemal (Cesa)



**Fig. 54** - *Andricus askewi* (Cynipidae) gall. Turkey Van Prov., Çatak Dalbastı 1600m 28 2 2010, photo M Kemal (Cesa)



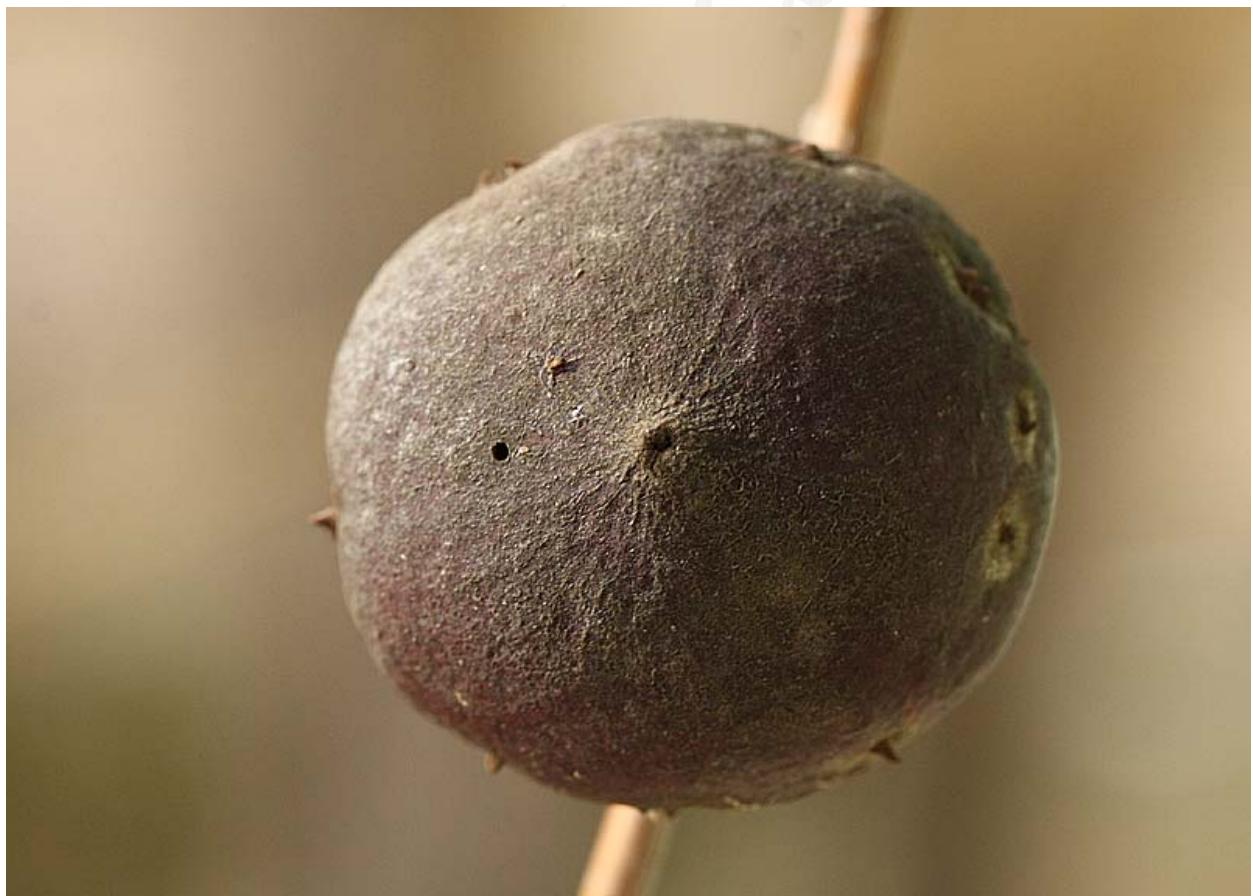
**Fig. 55-** *Andricus askewi* (Cynipidae) gall. Turkey Van Prov., Çatak Dalbastı 1600m 28 2 2010, photo M Kemal (Cesa)



**Fig. 56-** *Andricus caputmedusae* (Cynipidae) gall. Turkey Van Prov., Çatak Narlı bridge 1410m 14 3 2010, photo M. Kemal (Cesa)



**Fig. 57** - *Andricus insanus* (Cynipidae) gall. Turkey Bitlis Prov., Tatvan Kağanlı 1865m 22 2 2010 photo M Kemal (Cesa)



**Fig. 58**- *Andricus insanus* (Cynipidae) gall. Turkey Bitlis Prov., Tatvan Kağanlı 1865m 22 2 2010 photo M Kemal (Cesa)



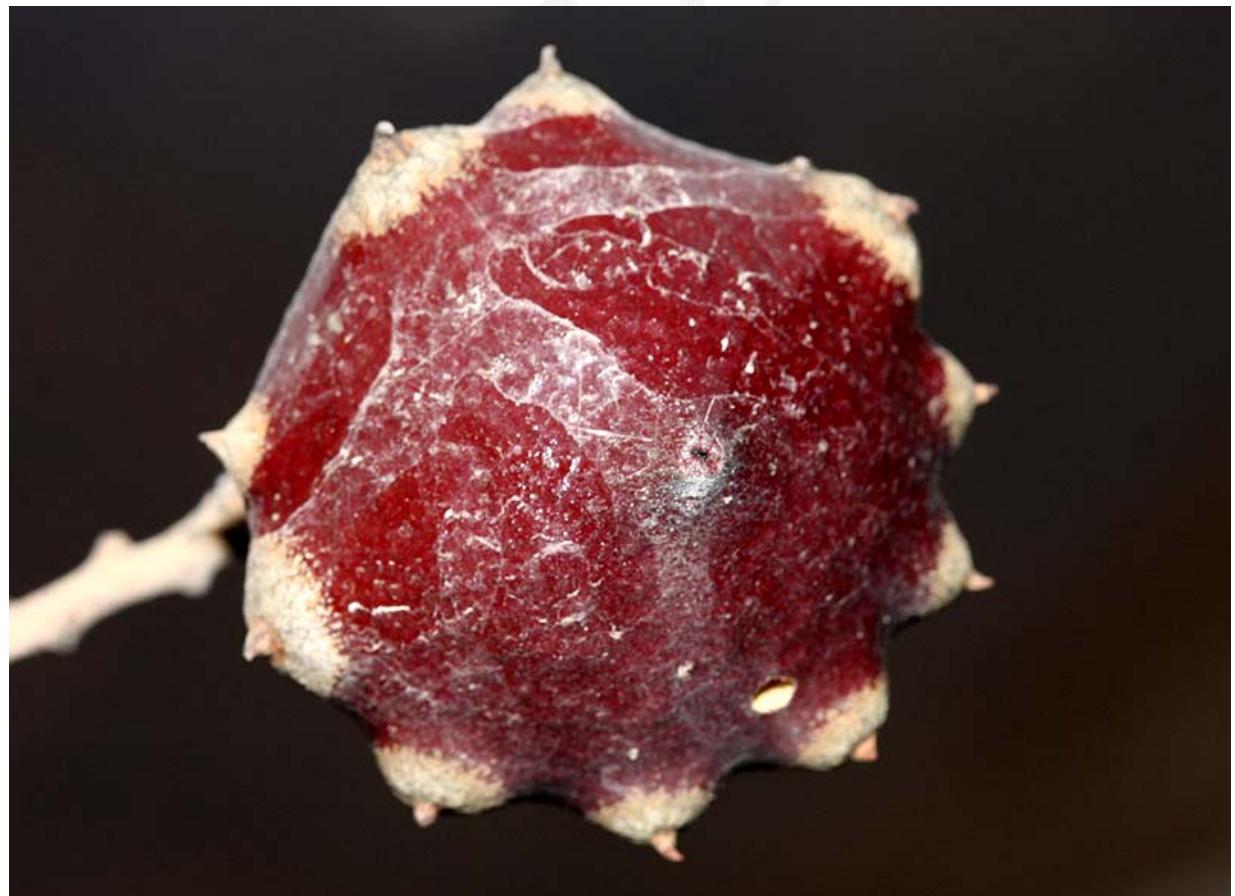
**Fig. 59-** *Andricus insanus* (Cynipidae) gall. Turkey Bitlis Prov., Tatvan Kağanlı 1865m 22 2 2010 photo M Kemal (Cesa)



**Fig. 60-** *Andricus insanus* (Cynipidae) gall. Turkey Van Prov., Çatak Dalbastı 1600m 28 2 2010 photo M Kemal (Cesa)



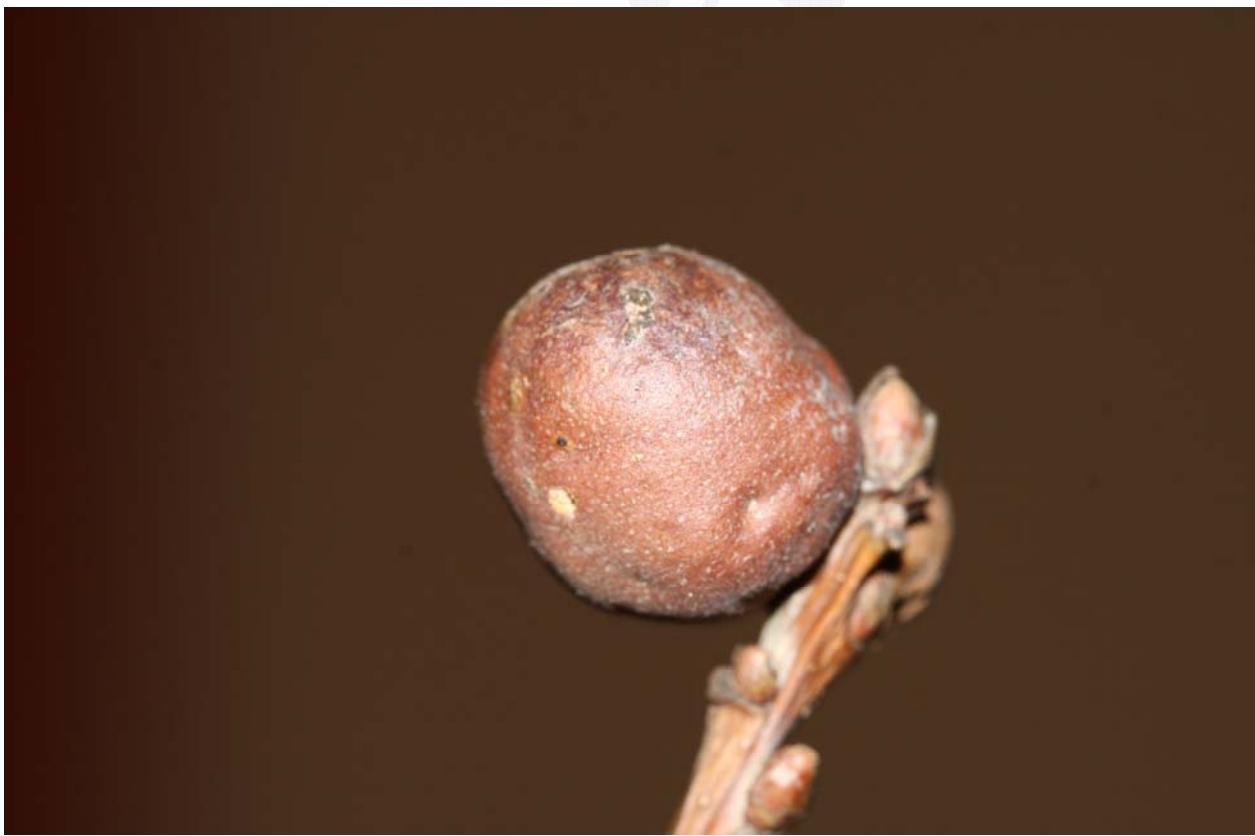
**Fig. 61** - *Andricus insanus* (Cynipidae) gall. Turkey Van Prov., Çatak Dalbastı 1600m 28 2 2010 photo M Kemal (Cesa)



**Fig. 62** - *Andricus insanus* (Cynipidae) gall. Turkey Van Prov., Çatak Dalbastı 1600m 28 2 2010 photo M Kemal (Cesa)



**Fig. 63 -** *Andricus kollari* (Cynipidae) Turkey Bitlis Prov., Tatvan Kağanlı 1865m 22 2 2010 photo M Kemal (Cesa)



**Fig. 64-** *Andricus ligniculus* (Cynipidae). Turkey Bitlis Prov., Tatvan Kağanlı 1865m, 22 2 2010 photo M Kemal (Cesa)



**Fig. 65** – *Andricus megalucidus* (Cynipidae) gall. Turkey Bitlis Prov., Tatvan Kağanlı 1860m 22 2 2010 photo M Kemal (Cesa)



**Fig. 66** - *Andricus megalucidus* (Cynipidae) gall. Turkey Van Prov., Çatak Dalbastı 1600m 28 2 2010 photo M Kemal (Cesa)



**Fig.67** - *Andricus moreae* (Cynipidae) Turkey Van Prov., Çatak Dalbastı 1600m 28 2 2010 photo M Kemal (Cesa)



**Fig.68** - *Andricus moreae* (Cynipidae) Turkey Van Prov., Çatak Dalbastı 1600m 28 2 2010 photo M Kemal (Cesa)



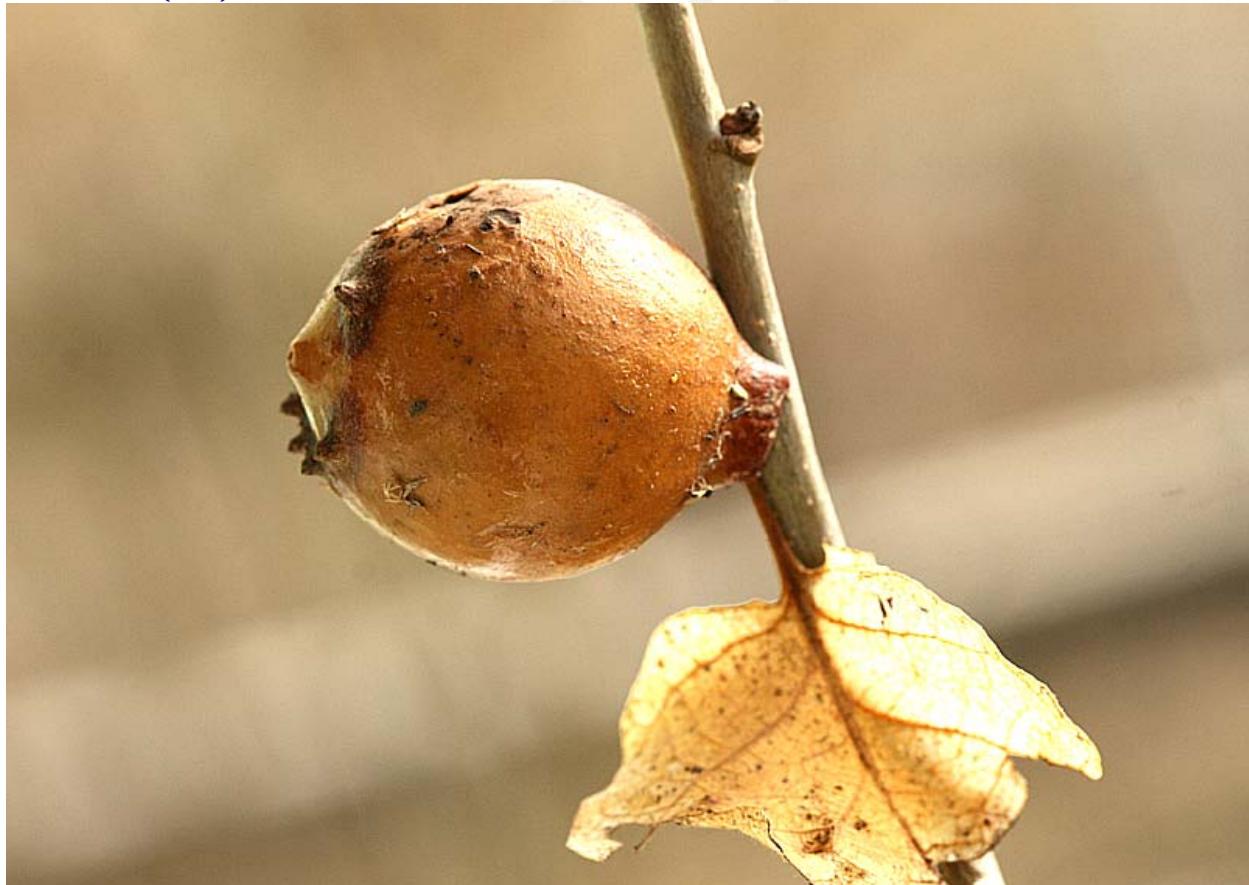
**Fig. 69-** *Andricus multiplicatus* (Cynipidae) gall. Turkey Van Prov., Çatak Dalbastı 1600m 28 2 2010 photo M. Kemal (Cesa)



**Fig. 70 -** *Andricus multiplicatus* (Cynipidae) gall. Turkey Van Prov., Çatak Dalbastı 1600m 28 2 2010 photo M. Kemal (Cesa)



**Fig. 71** - *Andricus multiplicatus* (Cynipidae) gall on *Quercus libani*. Turkey Van Prov., Çatak Dalbastı 1600m 28 2 2010 photo M. Kemal (Cesa)



**Fig. 72** - *Andricus quercustozae* (Cynipidae) Turkey Bitlis Prov., Tatvan Kağanlı 1865m 22 2 2010 photo M Kemal (Cesa)



**Fig. 73** - *Andricus quercustozae* (Cynipidae) Turkey Bitlis Prov., Tatvan Kağanlı 1865m 22 2 2010 photo M Kemal (Cesa)



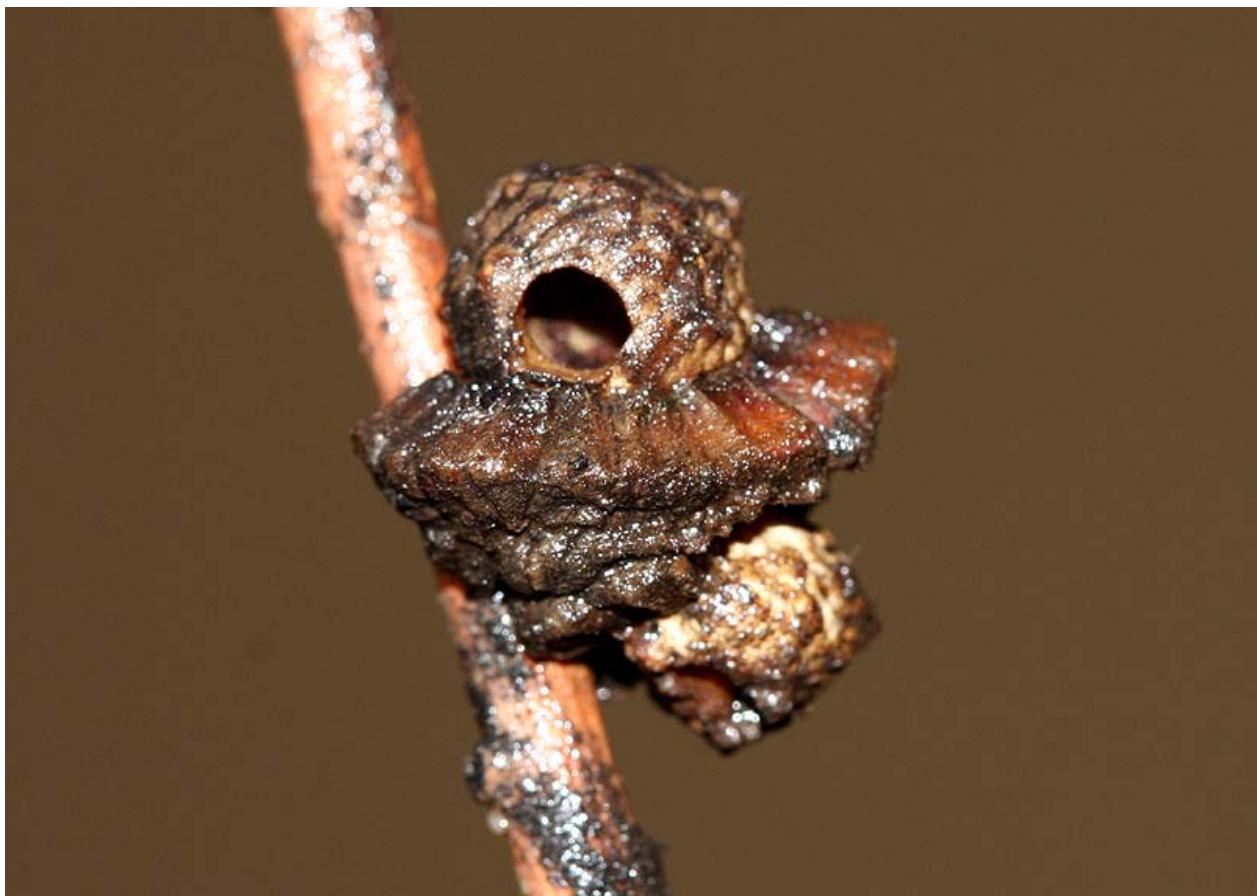
**Fig. 74** - *Andricus quercuscalicis* (Cynipidae). Turkey Van Prov., Çatak Narlı bridge 1410m 14 3 2010 photo M.Kemal (Cesa)



**Fig.75** - *Andricus quercuscalicis* (Cynipidae). Turkey Van Prov., Çatak Narlı bridge 1410m 14 3 2010 photo M.Kemal (Cesa)



**Fig. 76** - *Andricus sternlichti* (Cynipidae) Turkey Van Prov., Çatak Dalbastı 1600m 28 2 2010 photo M Kemal (Cesa)



**Fig. 77-** *Andricus trunciculus* (Cynipidae) gall. Turkey Van Prov., Çatak Narlı bridge 1410m 14 3 2010 photo M.Kemal (Cesa)



**Fig. 78 -** *Andricus trunciculus* (Cynipidae) gall. Turkey Van Prov., Çatak Narlı bridge 1410m 14 3 2010 photo M.Kemal (Cesa)



**Fig. 79** - *Andricus megatrunciculus* (Cynipidae) gall. Turkey Van Prov., Çatak Narlı bridge 1410m 14 3 2010 photo M.Kemal (Cesa)



**Fig. 80**- *Aphelonyx persicae* (Cynipidae) gall. Turkey Van Prov., Çatak Dalbastı, 1600m, 28 2 2010 Photo M. Kemal (Cesa)



Fig. 81 - *Biorhiza pallida* (Cynipidae) gall. Turkey Bitlis Prov., Tatvan Kağanlı 1865m 22 2 2010 photo M Kemal (Cesa)



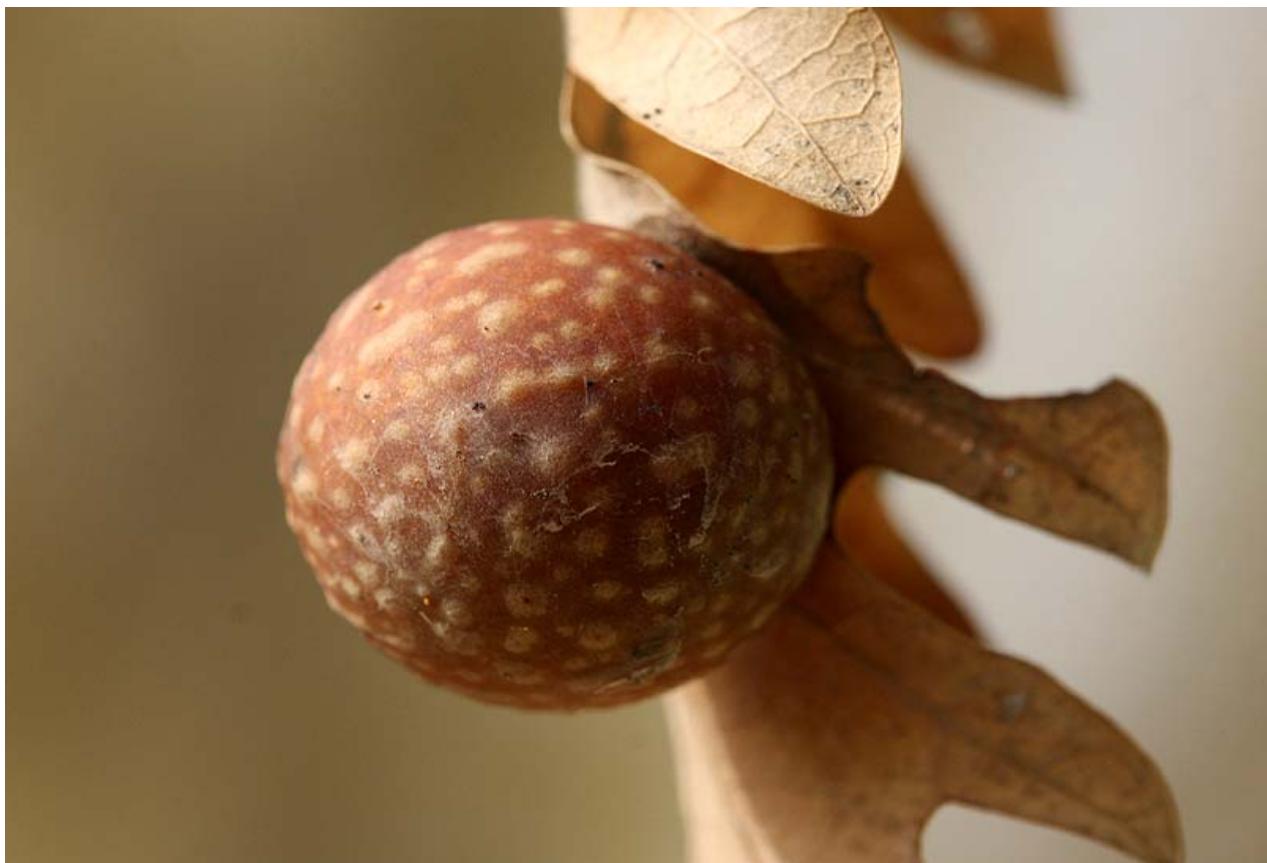
Fig. 82 - *Biorhiza pallida* (Cynipidae) gall. Turkey Bitlis Prov., Tatvan Kağanlı 1865m 22 2 2010 photo M Kemal (Cesa)



**Fig. 83** - *Cynips quercus* (Cynipidae) gall. Turkey Van Prov., Çatak Dalbastı 1600m 28 2 2010 photo M Kemal (Cesa)



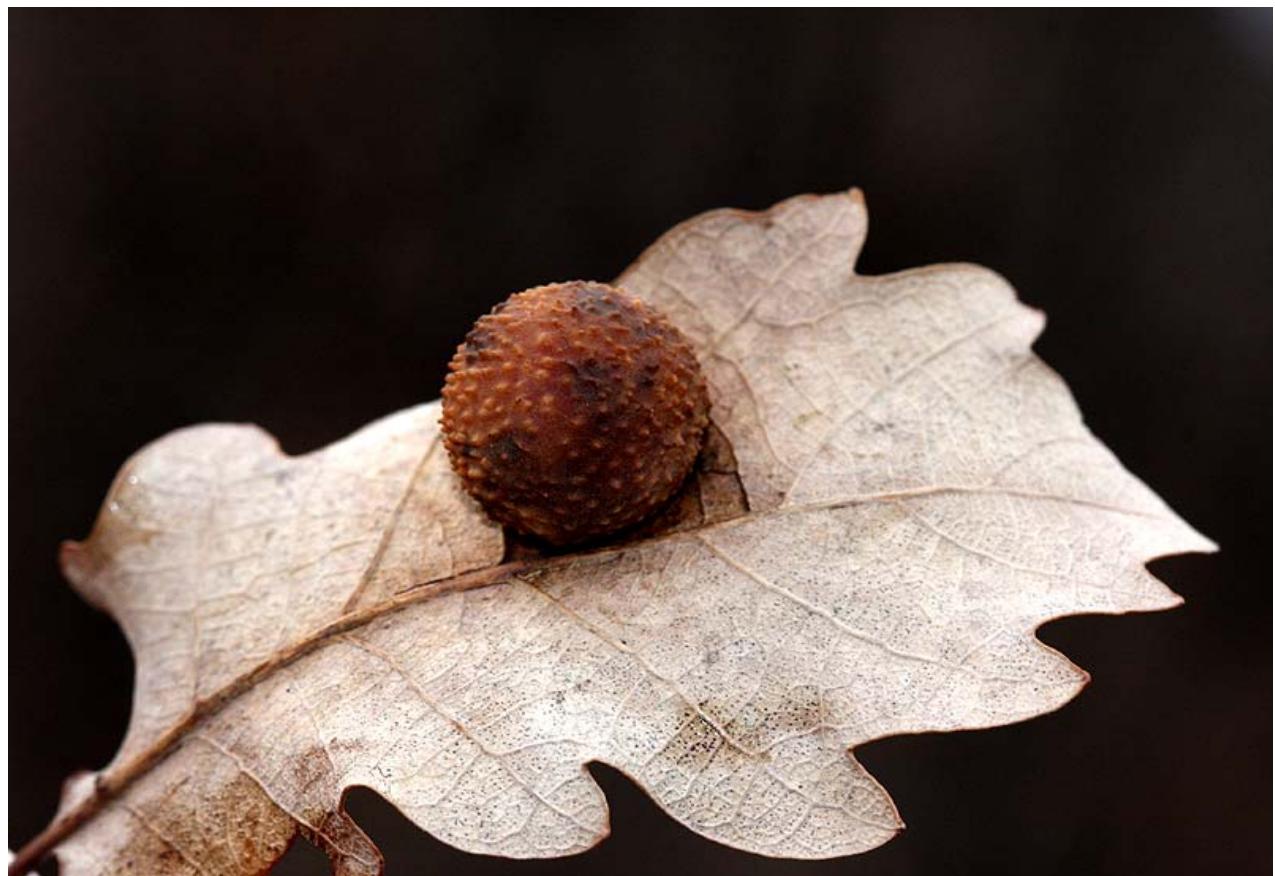
**Fig. 84** - *Cynips quercus* (Cynipidae) gall. Turkey Van Prov., Çatak Dalbastı 1600m 28 2 2010 photo M Kemal (Cesa)



**Fig. 85** - *Cynips quercusfolii* (Cynipidae) gall. Turkey Bitlis Prov., Tatvan Kağanlı 1865m 22 2 2010 photo M Kemal (Cesa)



**Fig. 86** - *Cynips quercusfolii* (Cynipidae) gall. Turkey Van Prov., Çatak Dalbastı 1600m 28 2 2010 photo M Kemal (Cesa)



**Fig. 87** - *Cynips quercusfolii* (Cynipidae) gall. Turkey Van Prov., Çatak Dalbastı 1600m 28 2 2010 photo M Kemal (Cesa)



**Fig. 88** - *Neuroterus anthracinus* (Cynipidae) gall. Turkey Van Prov., Çatak Dalbastı 1650m 14 3 2010 photo M.Kemal (Cesa)



**Fig. 89** - *Neuroterus quercusbaccarum* (Cynipidae) gall. Turkey Van Prov., Çatak Dalbastı 1600m 28 2 2010 photo M Kemal (Cesa)



**Fig. 90** - *Diplolepis fructuum* (Cynipidae) galls on *Rosa* sp. Turkey Van Prov. Edremit Çiçekli 1660m, 22 2 2010, photo M.Kemal (Cesa)

## Distributions of the wasp galls recorded in South of Van Lake

Range in the World (top left)  
(based on states)Range in Turkey (below left)  
(based on provinces)

South East of Van Lake Basin (top right)

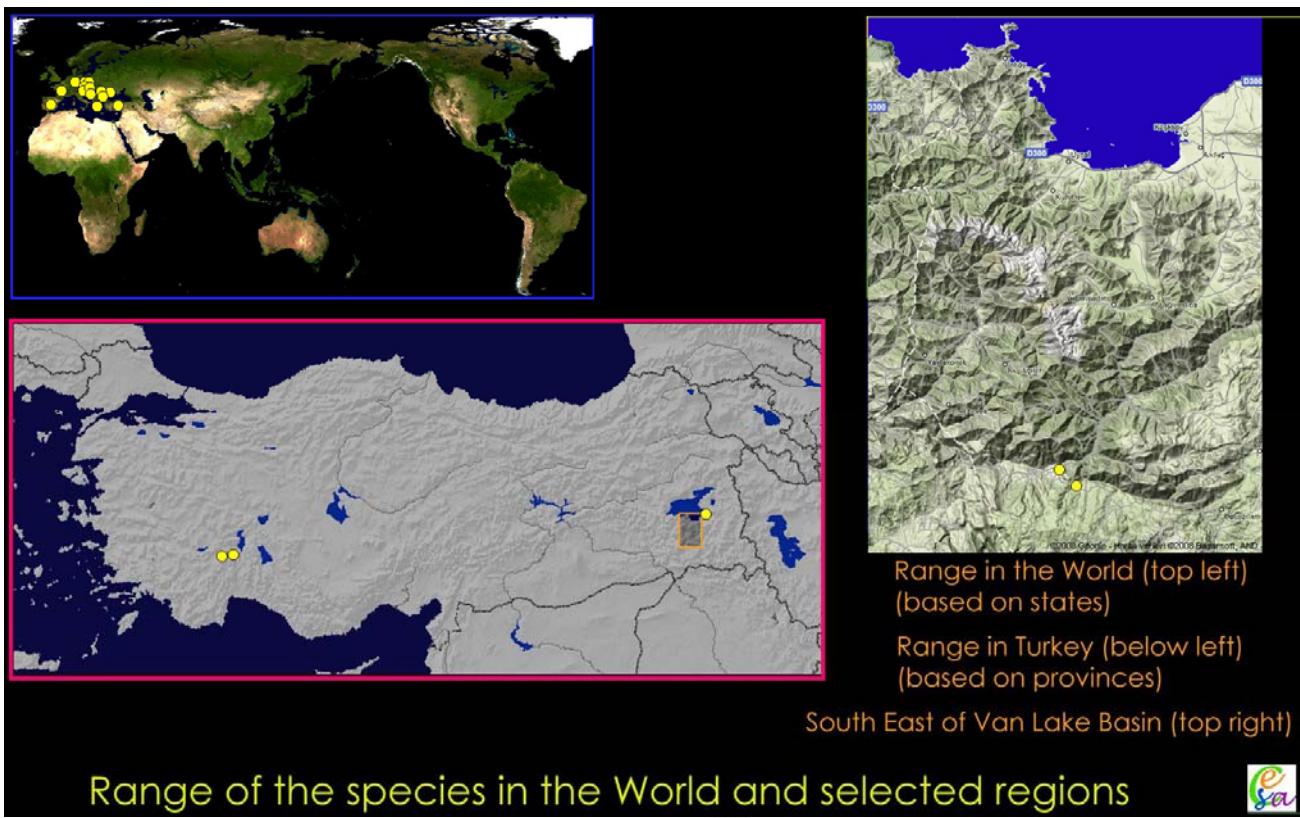
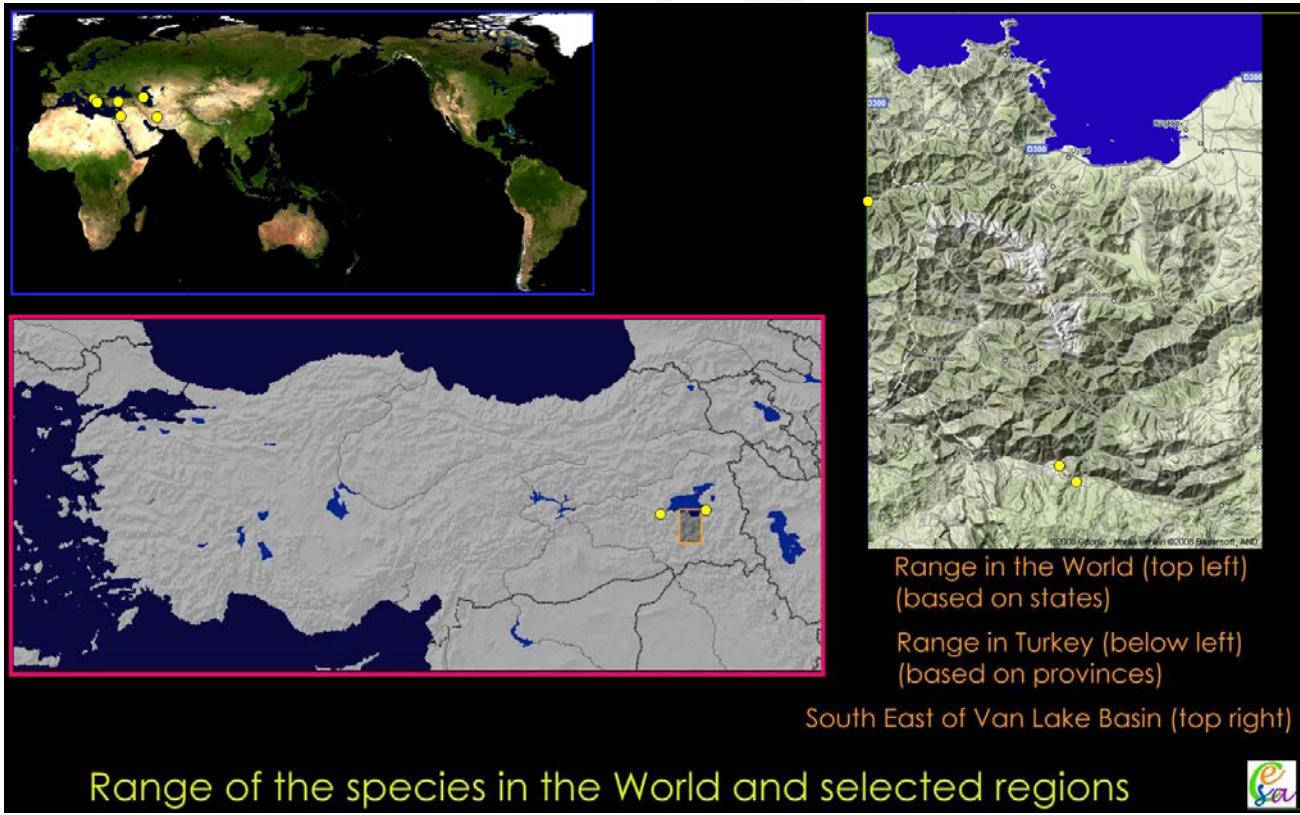
## Range of the species in the World and selected regions

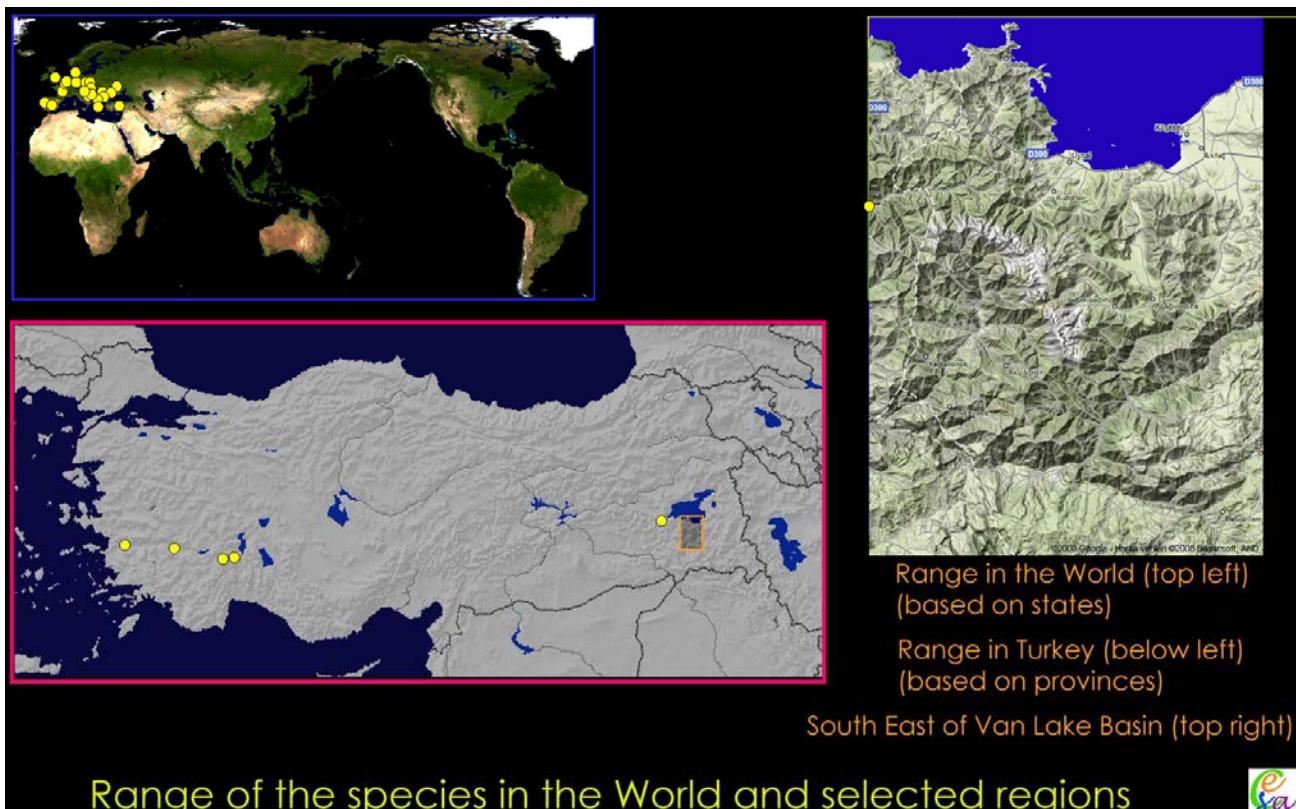
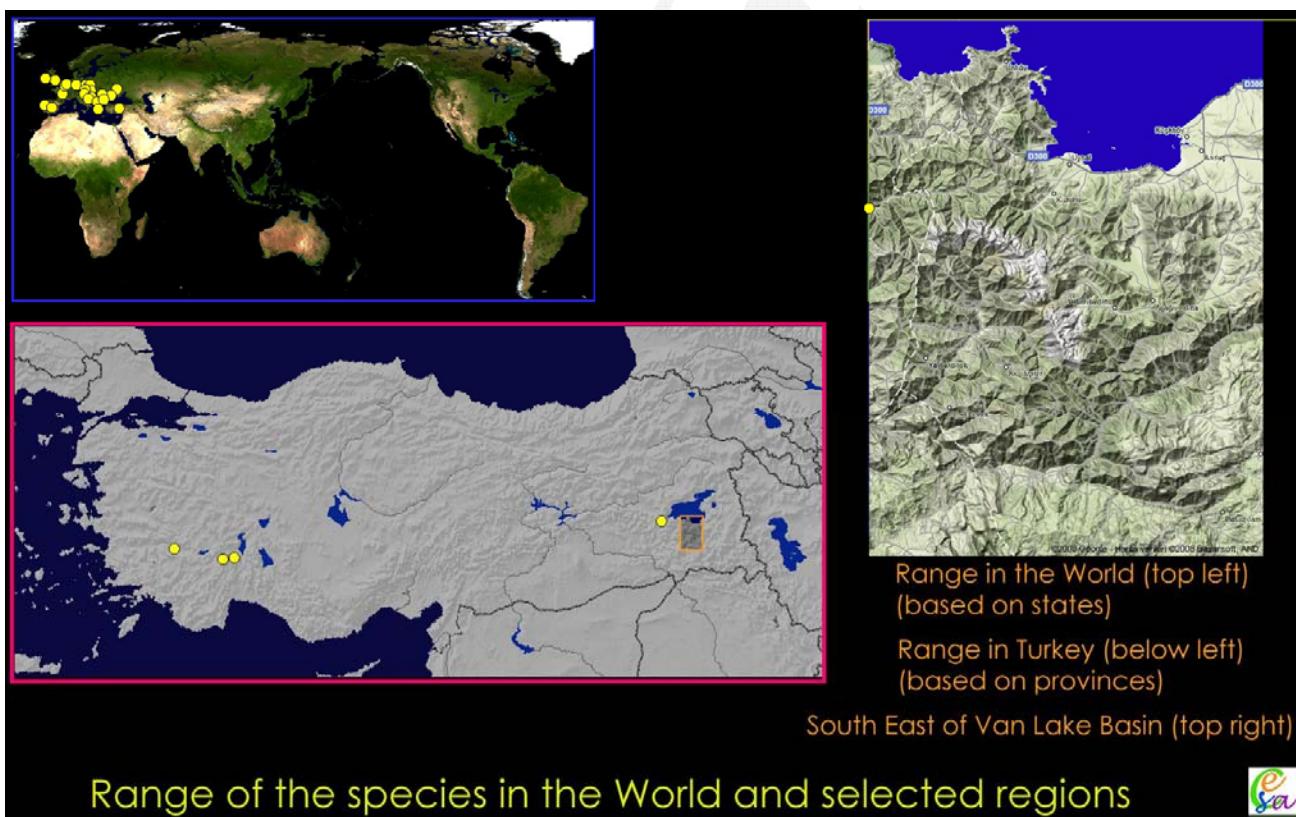
Map 1- Range of *Andricus aries*Range in the World (top left)  
(based on states)Range in Turkey (below left)  
(based on provinces)

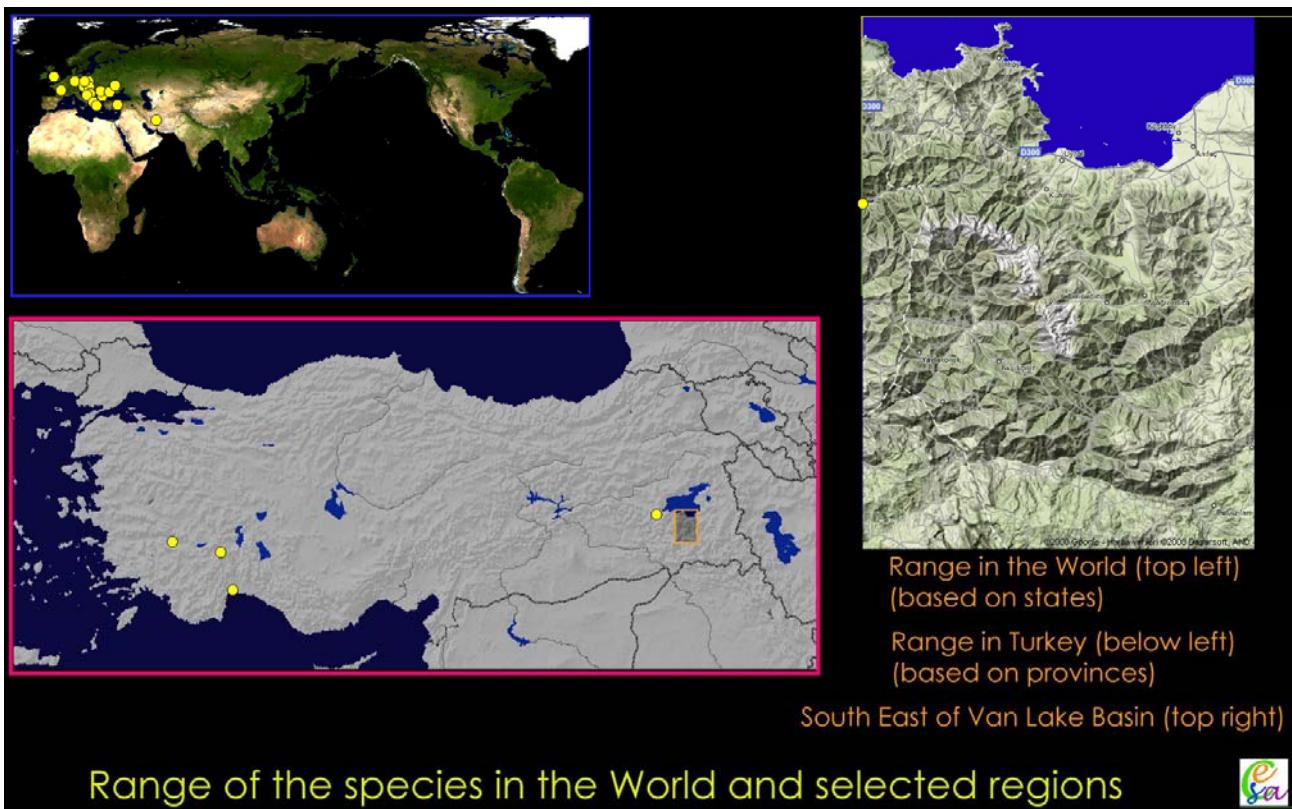
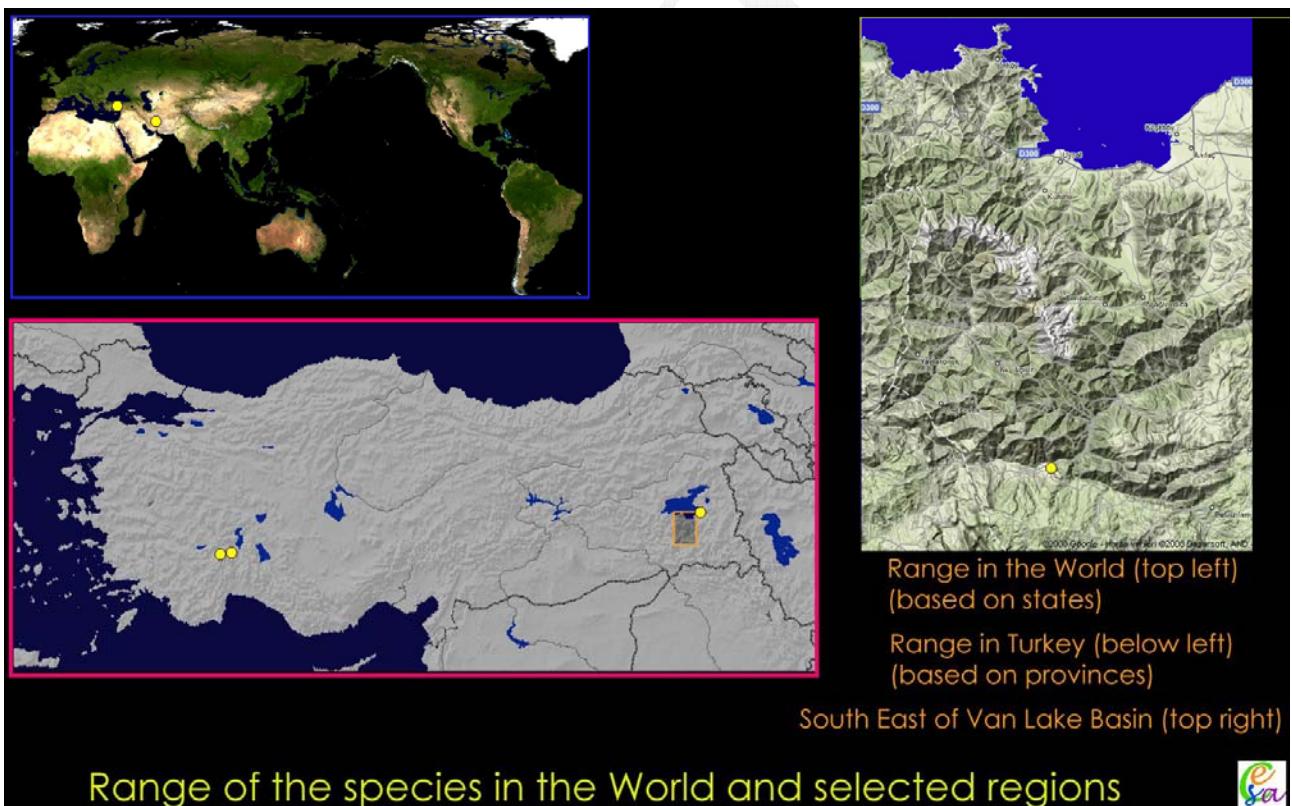
South East of Van Lake Basin (top right)

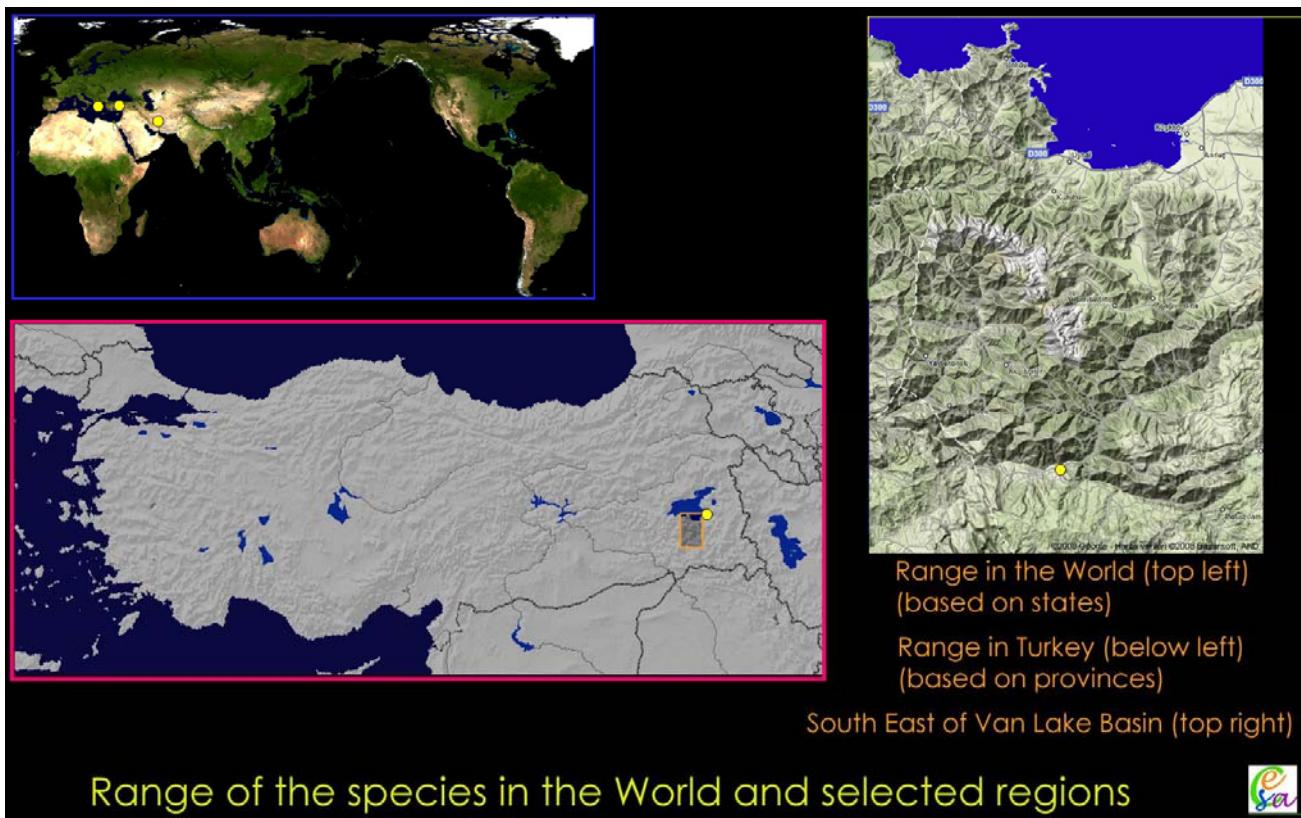
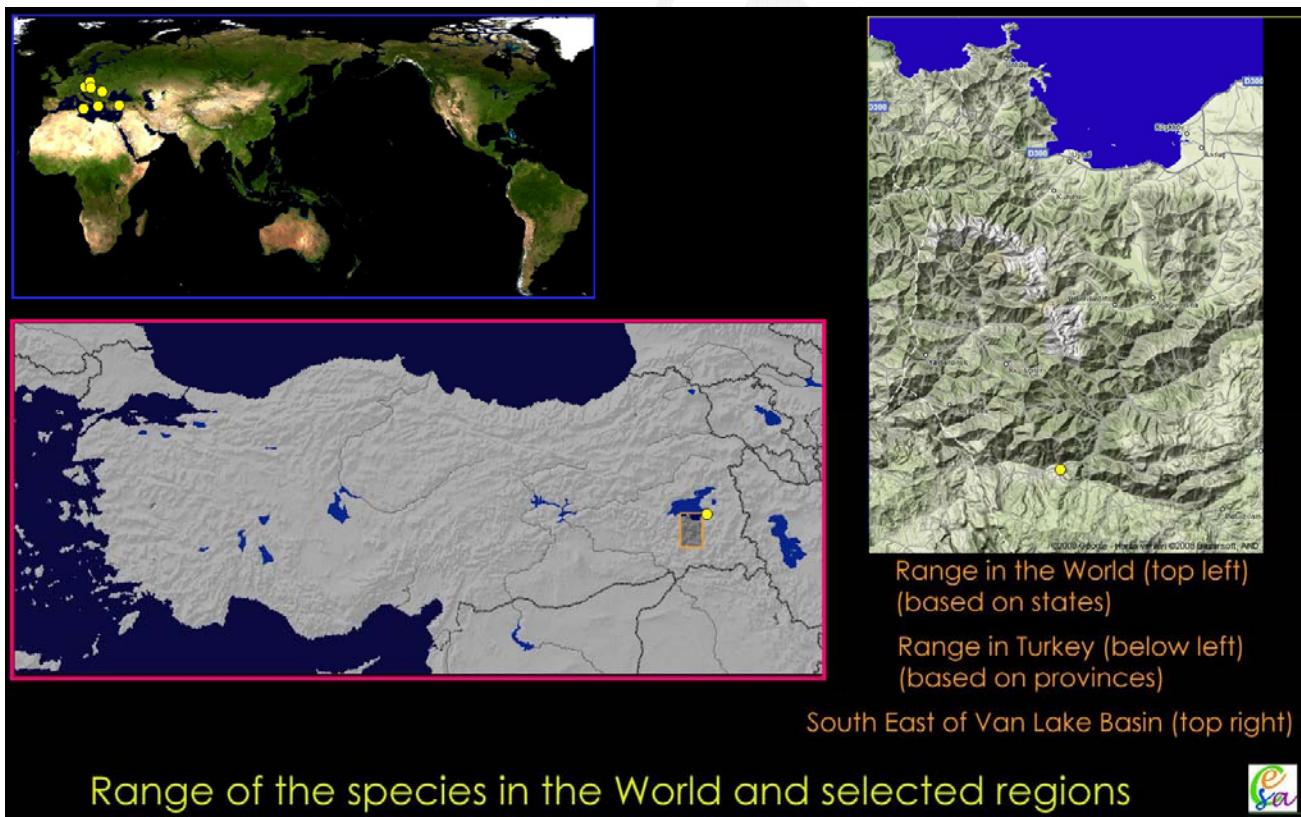
## Range of the species in the World and selected regions

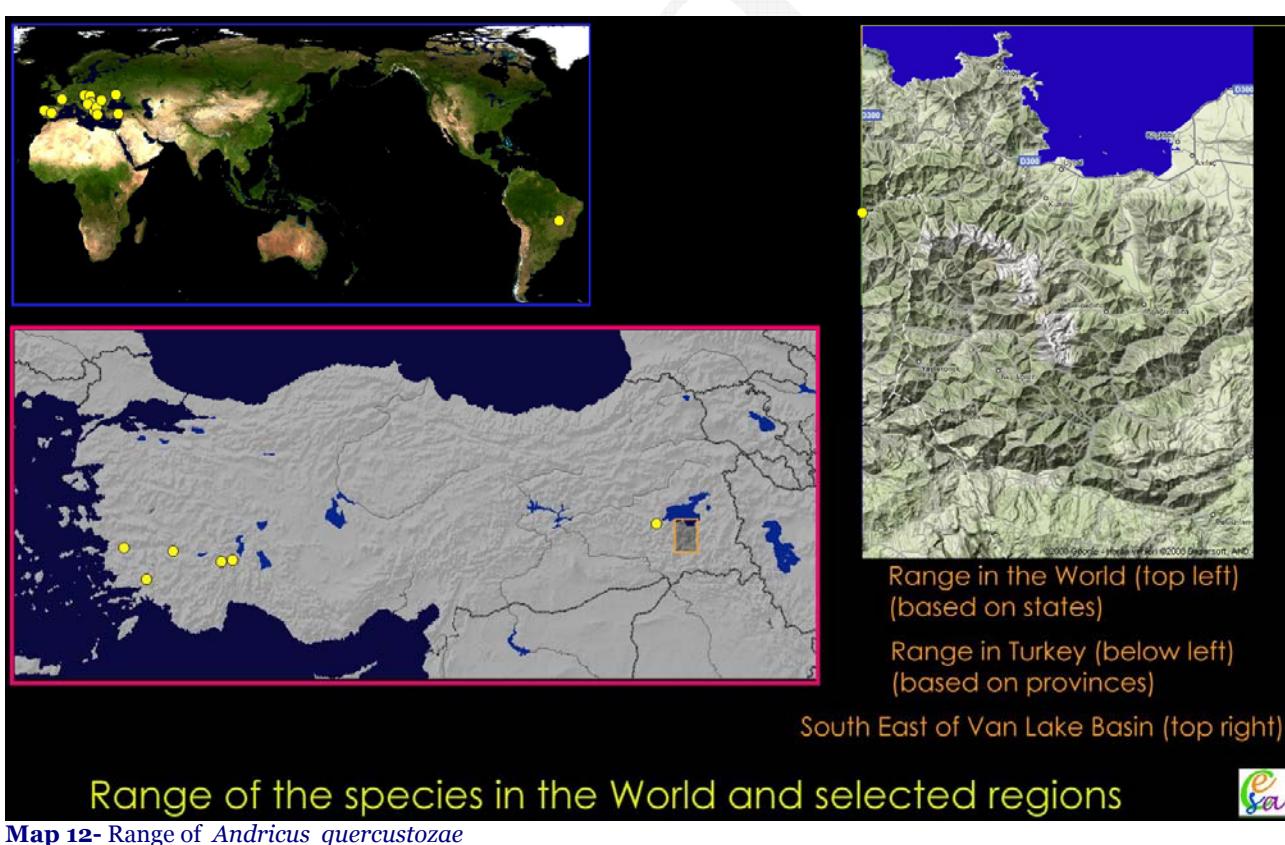
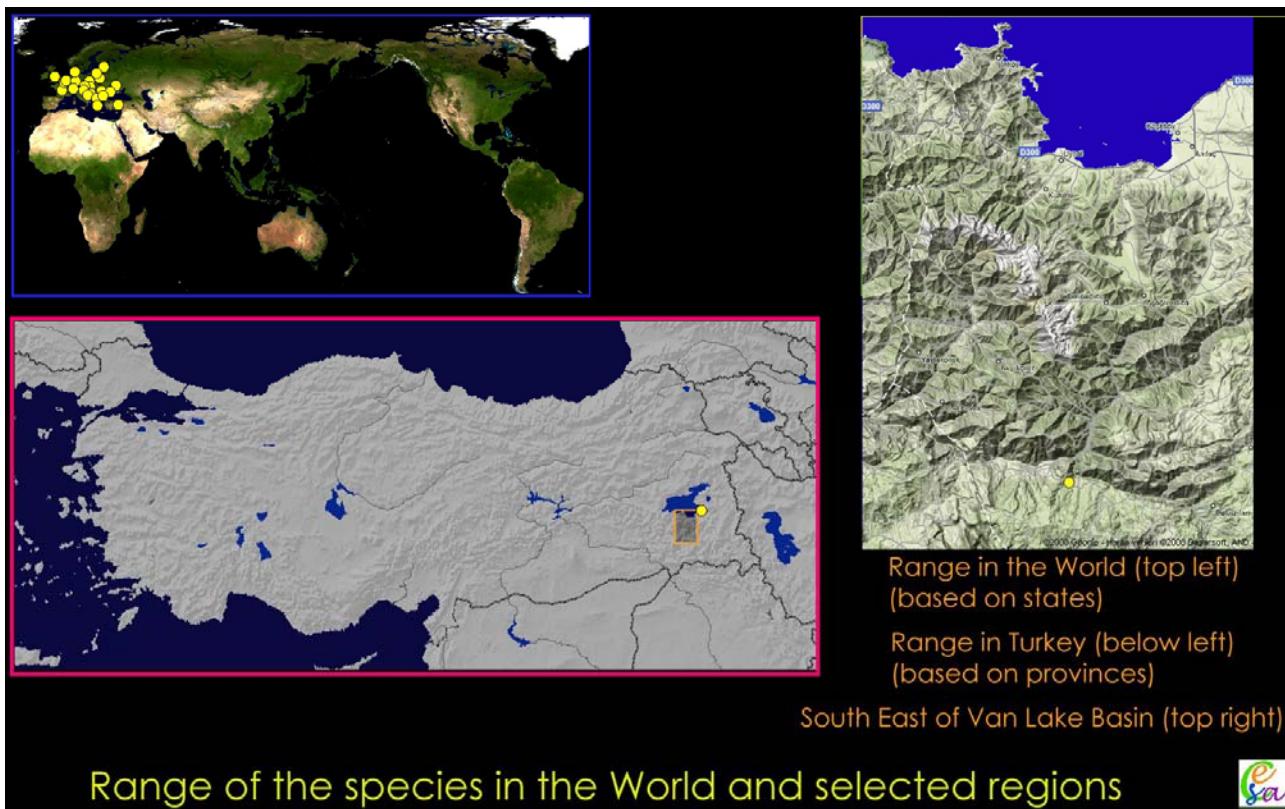
Map 2- Range of *Andricus askewi*

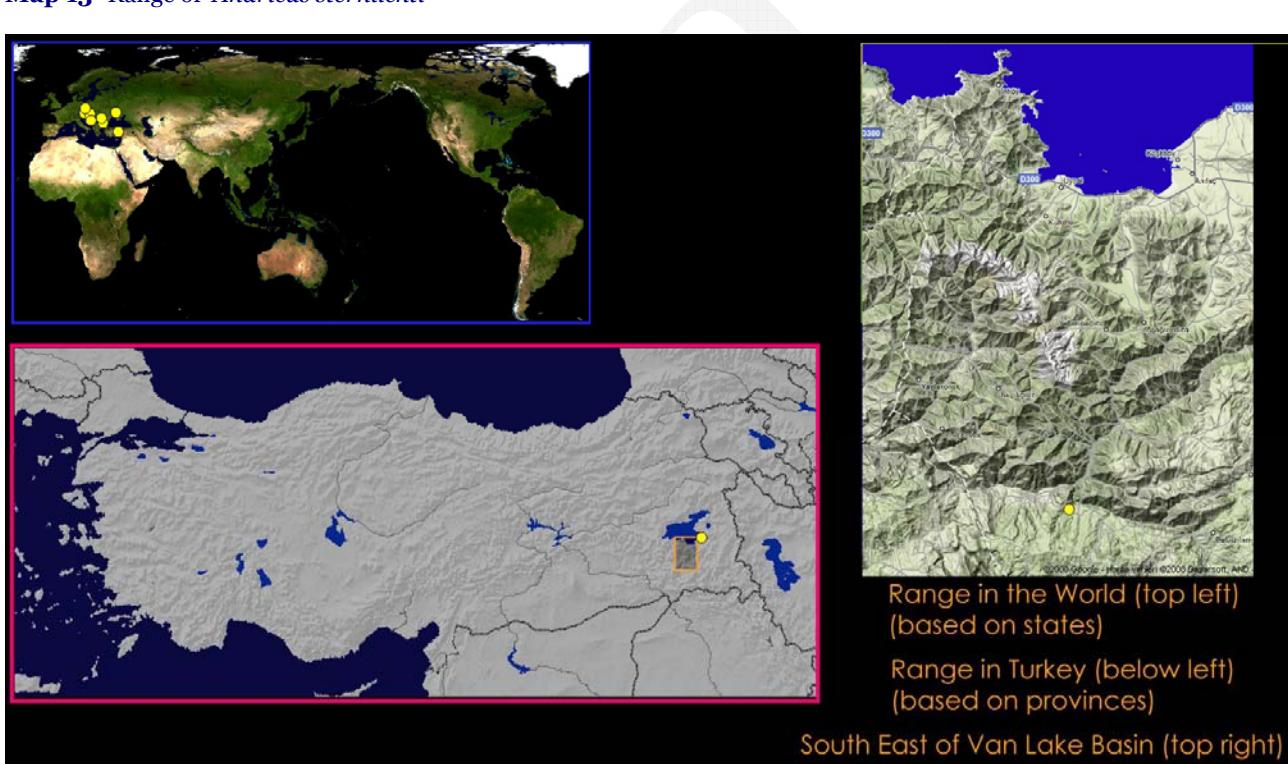
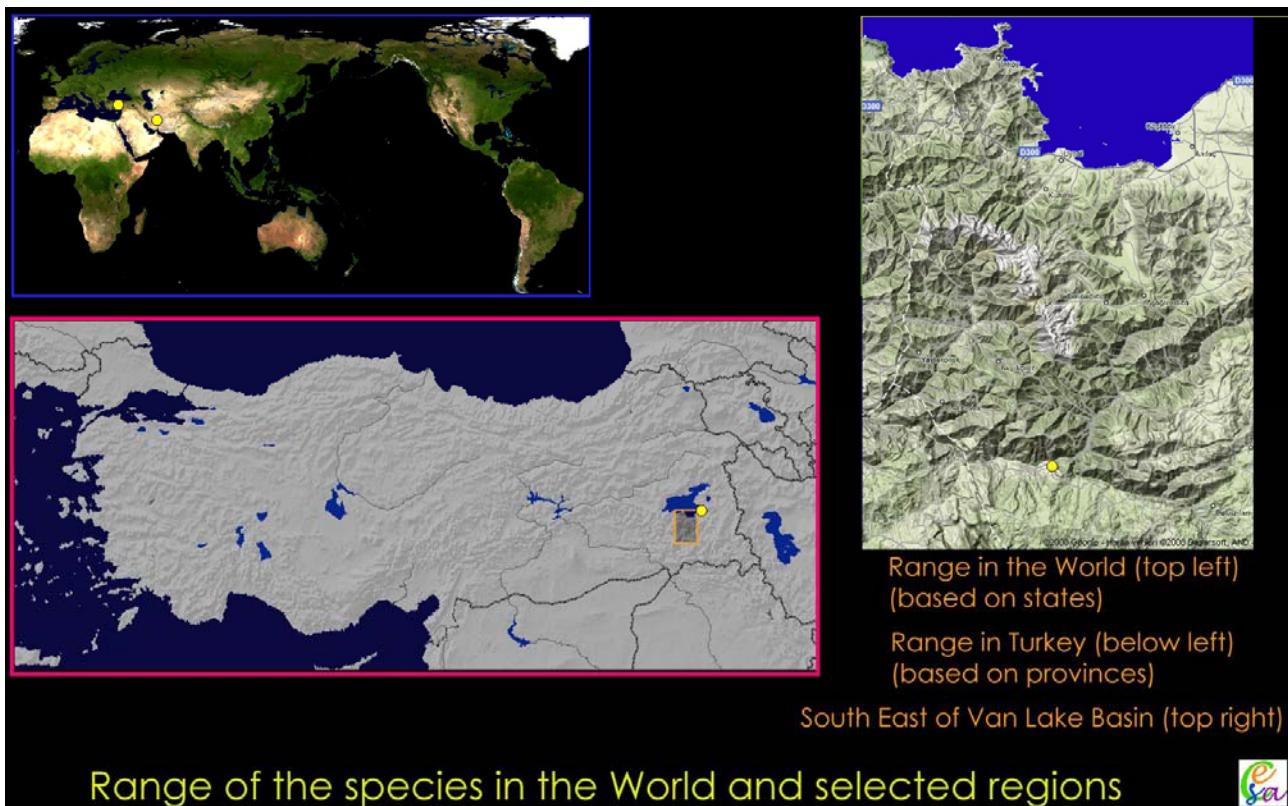
Map 3- Range of *Andricus caputmedusae*Map 4- Range of *Andricus insanus*

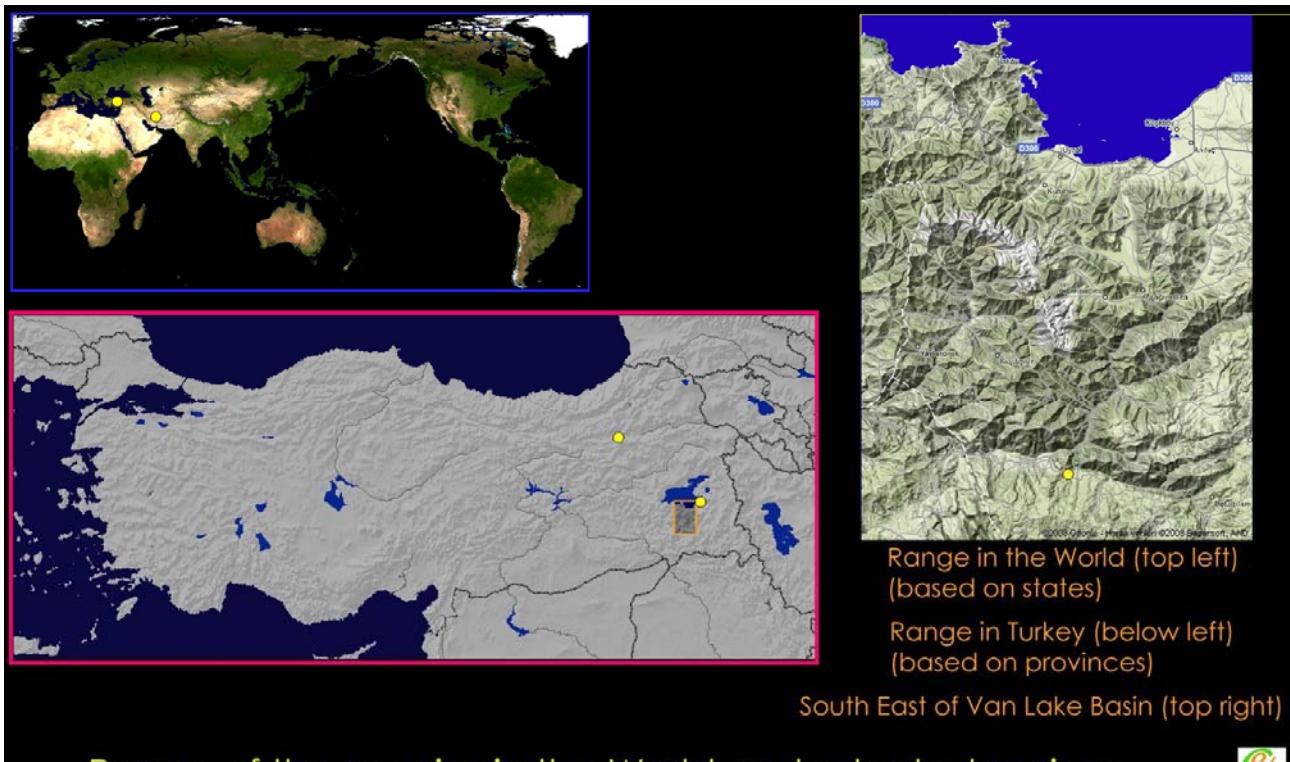
Map 5- Range of *Andricus kollari*Map 6- Range of *Andricus ligniculus*

Map 7- Range of *Andricus lucidus*Map 8- Range of *Andricus megalucidus*

Map 9- Range of *Andricus moreae*Map 10- Range of *Andricus multiplicatus*

Map 12- Range of *Andricus quercustozae*

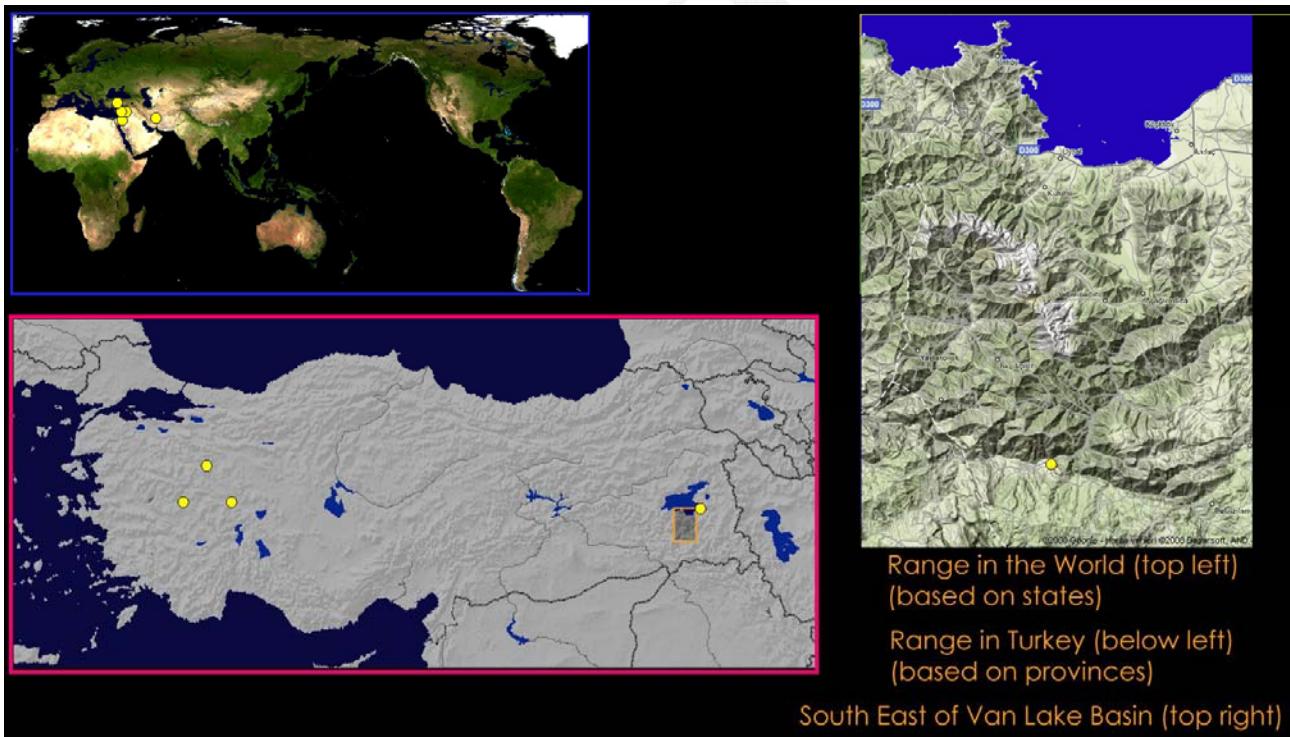
Map 14- Range of *Andricus trunciculus*



### Range of the species in the World and selected regions



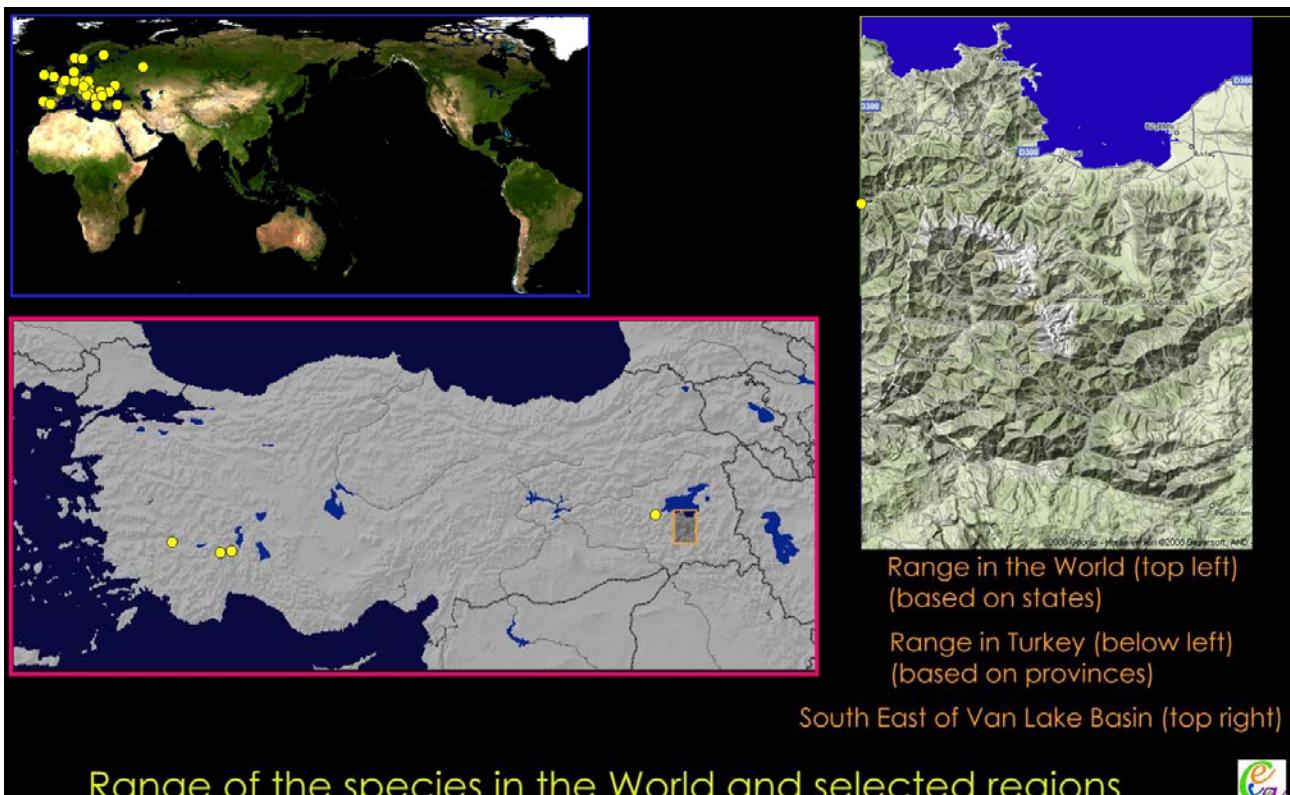
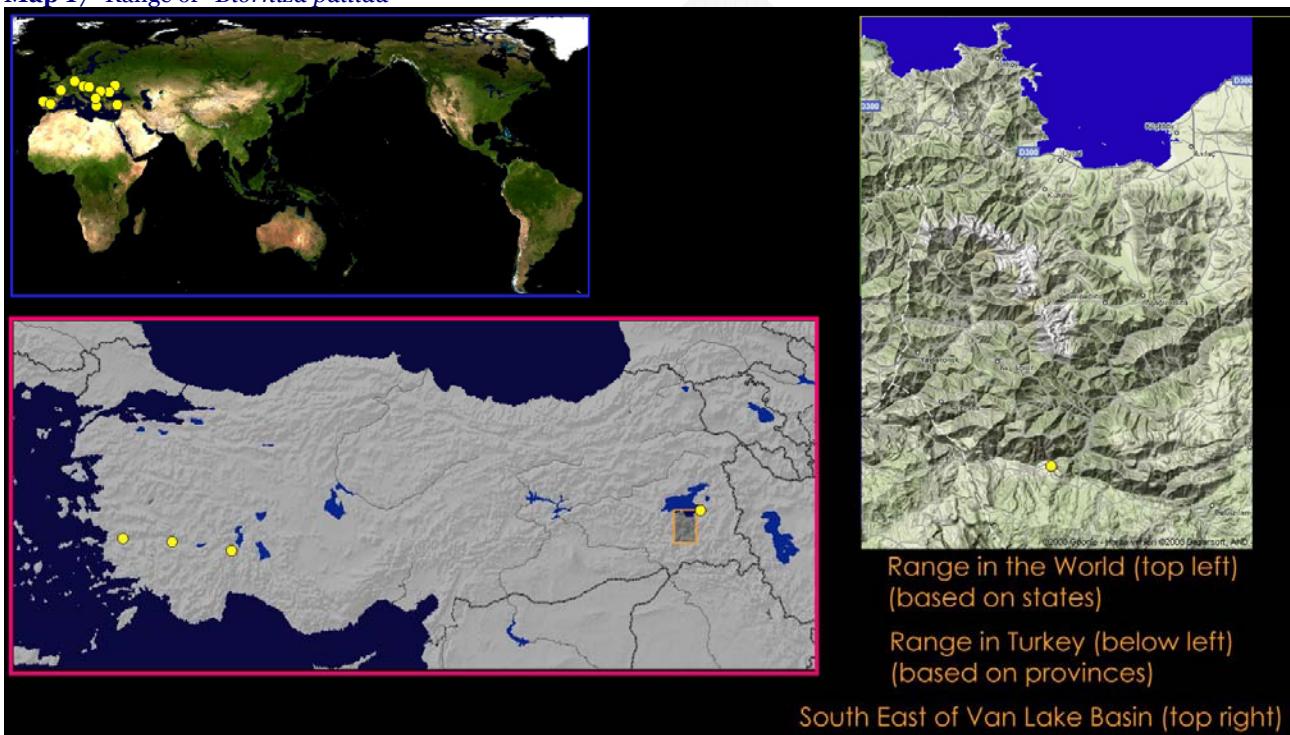
Map 15- Range of *Andricus megatrunciculus*

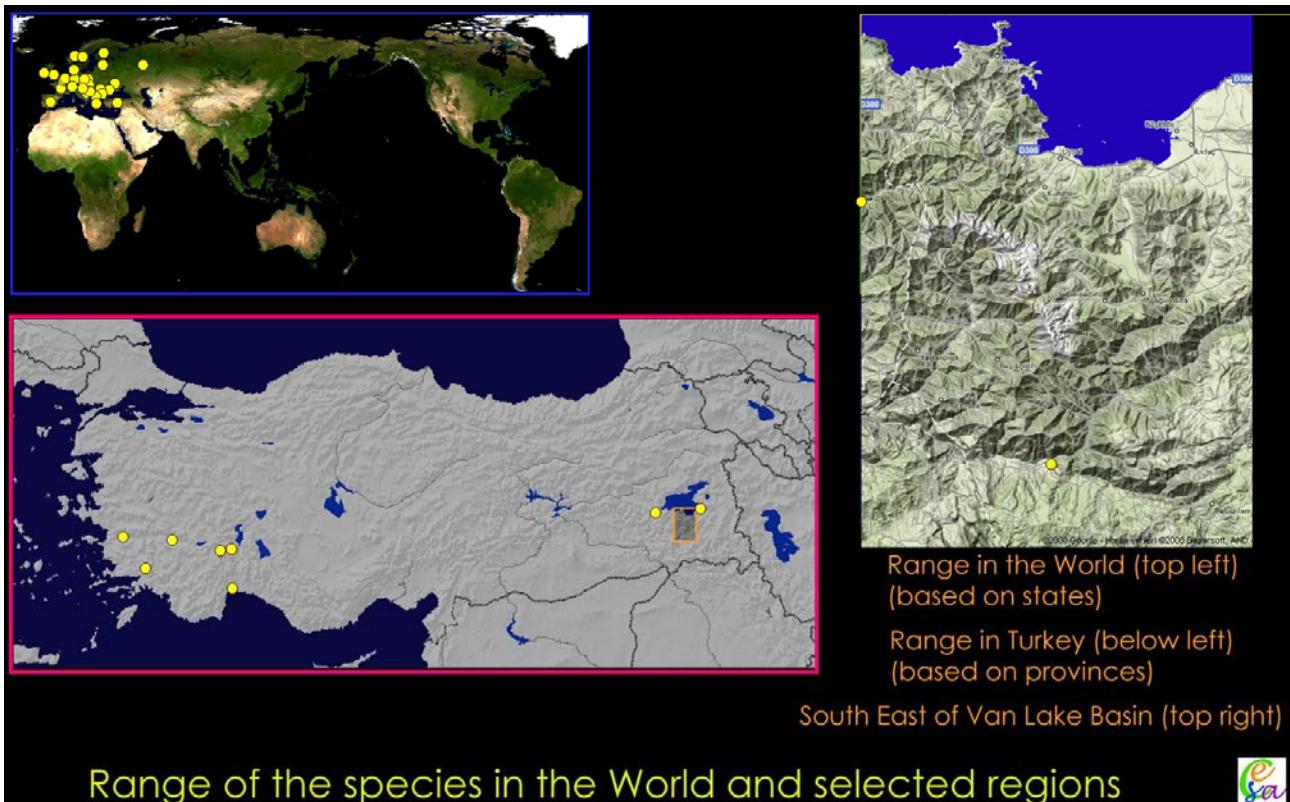
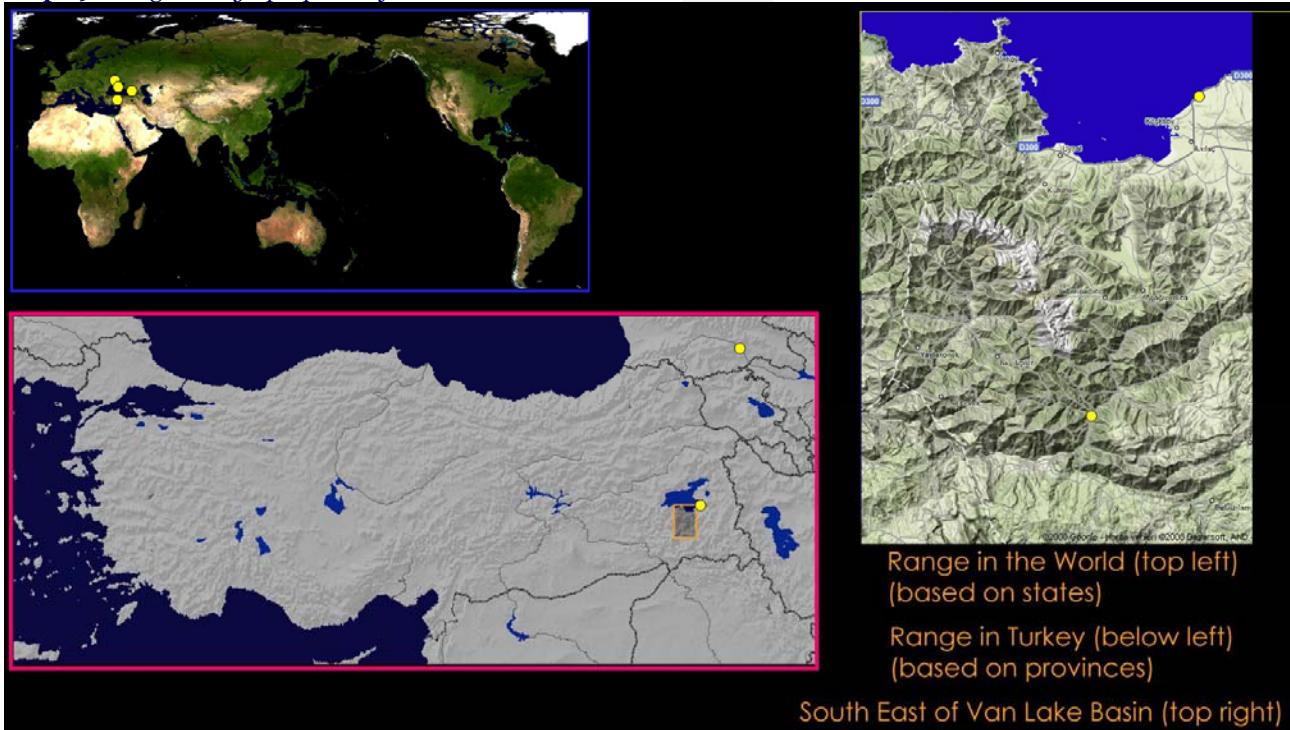


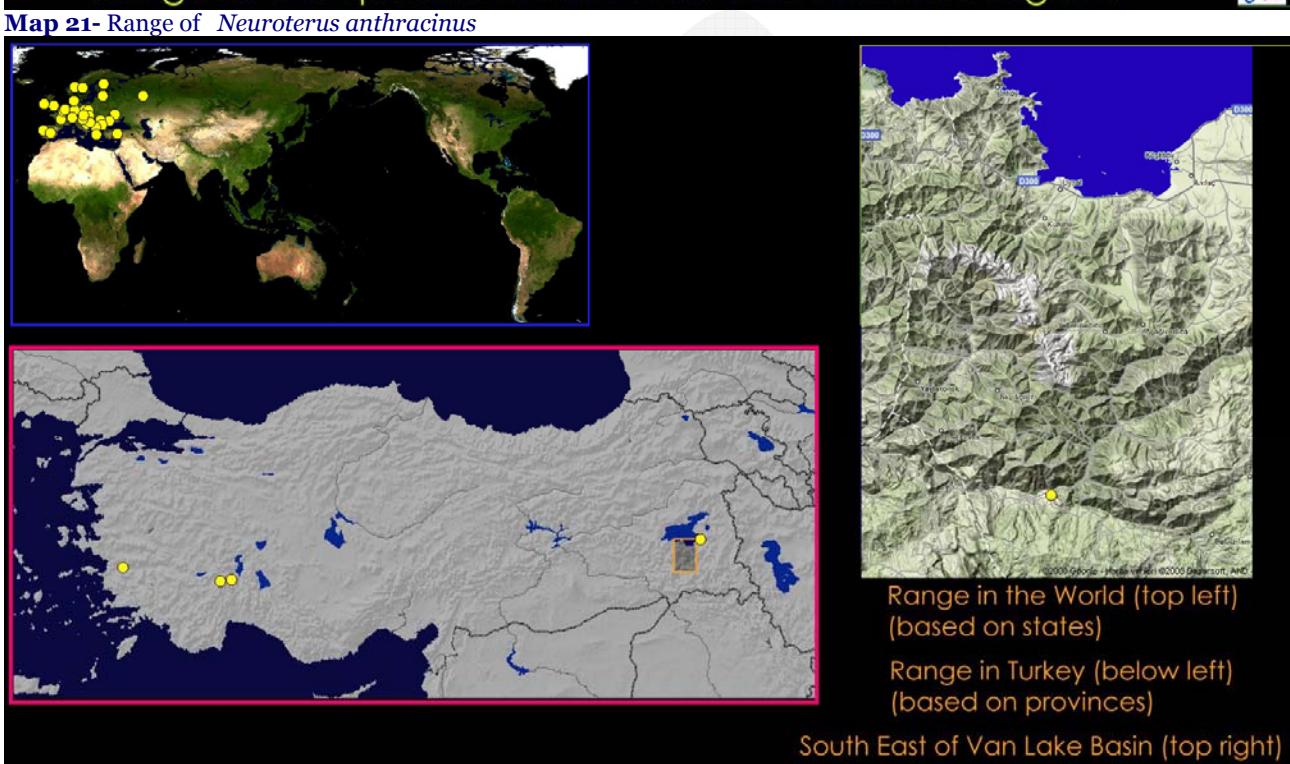
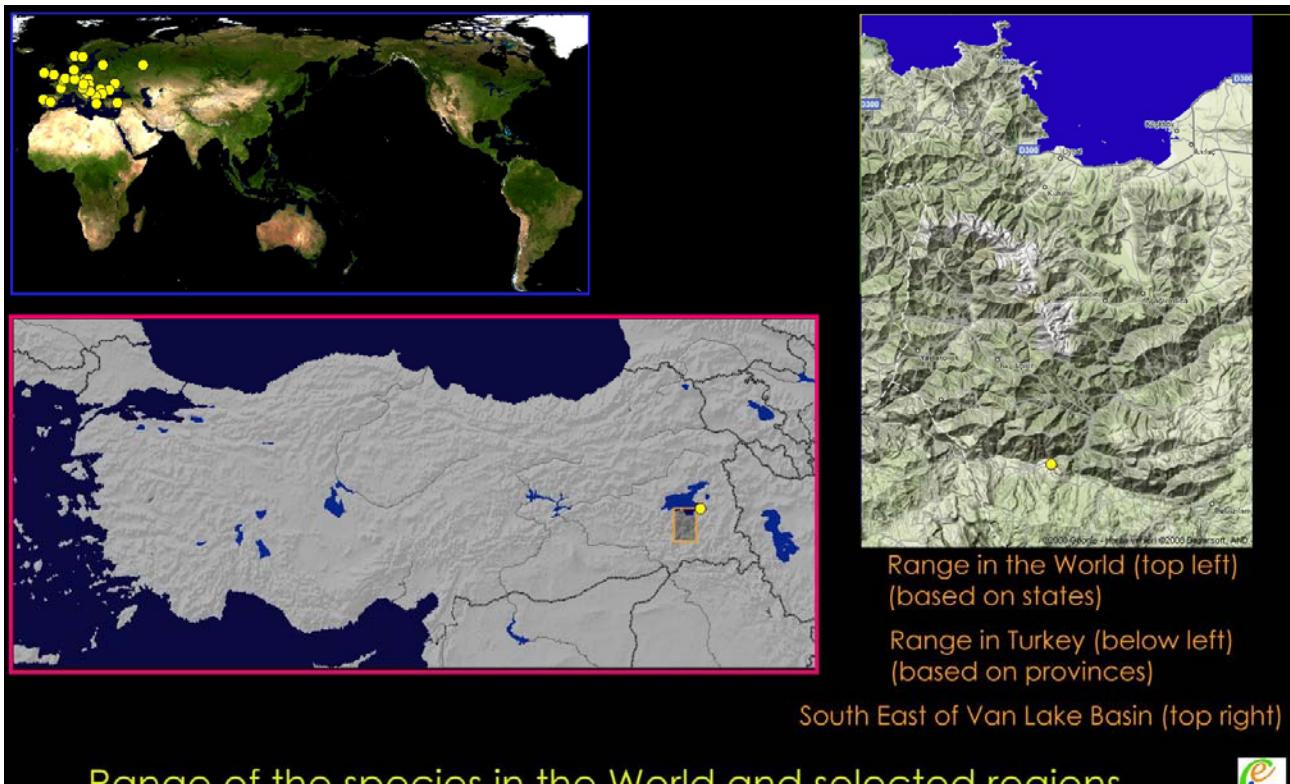
### Range of the species in the World and selected regions



Map 16- Range of *Aphelonyx persica*

Map 17- Range of *Biorhiza pallida*Map 18- Range of *Cynips quercus*

Map 19- Range of *Cynips quercusfolii*Map 20- Range of *Diplolepis fructuum*



# The Pink Hibiscus Mealybug, *Maconellicoccus hirsutus* (Green), a new pest on Guava trees in Jordan (*Hemiptera, Sternorrhyncha, Pseudococcidae*)

Manal Halaybeh <sup>5</sup> Ahmad Katbeh- Bader <sup>6</sup>

**Abstract:** The Pink Hibiscus Mealybug, *Maconellicoccus hirsutus* (Green), a new pest on Guava trees in Jordan (*Hemiptera, Sternorrhyncha, Pseudococcidae*). *Cesa News* 56: 67-71, 6 figures.

In this paper, a new pest, *Maconellicoccus hirsutus* (Green) is reported from Jordan for the first time. Biology and natural enemies are briefly discussed and illustrated. Distributional information is also given.

**Key words:** *Maconellicoccus hirsutus*, *Hemiptera, Sternorrhyncha, Pseudococcidae*, pest, biology, Guava tree, fauna, Jordan.

Few years ago, mealybugs were observed attacking guava trees in many parts of Jordan. At first, these mealybugs were thought to be the spherical mealy bug, *Nipaecoccus viridis* Newstead, which was a serious pest of citrus trees in Jordan Valley at early 1980's (Katbeh-Bader, 1986). However, while preparing a booklet on the pests of guava trees, the first author noticed that the mealybugs attacking the guava trees were different from the spherical mealybug. Therefore, specimens were collected from guava trees in Jordan Valley (**Fig. 1**) and sent to the curator of the University of Jordan Insects Museum (the second author). This was followed by a joint field trip in December 2009 on which colour photographs were taken to the pest and some of its natural enemies. Slides of immatures as well as adults were prepared, examined under the microscope, and compared to the detailed descriptions given by Miller (1999), who gave detailed descriptions to all male and female instars of this species and compared them to other common pests of mealybugs. The specimens were found to belong to Pink Hibiscus Mealybug (PHM), *Maconellicoccus hirsutus* (**Fig. 2**), which is recorded for the first time in Jordan.

The pink hibiscus mealybug, *Maconellicoccus hirsutus* (Green), is a pest of many plants, trees, and shrubs. It infests hibiscus, citrus, coffee, sugar cane, annonas, plums, guava, mango, okra, sorrel, teak, mora, pigeon pea, peanut, grape vines, maize, asparagus, chrysanthemum, beans, cotton, soybean, cocoa, and many other plants (USDA-APHIS 2002).

Ranjan (2006) mentioned that a female can lay more than 500 eggs (**Fig. 3**) at one time. Modes of transport include crawler and egg sack dispersion through wind and by movement, attaching or sticking to animals or transported objects. Nursery plants and trade of infested commodities also lead to its spread. Sometimes, ants that are attracted to its honeydew may act as protectors and movers of PHM. Kairo *et al.* (2000) reviewed the biological control of this pest giving information on its distribution and factors that lead to its rapid spread in the Caribbean. He mentioned that prior to its appearance in the Caribbean; the pest was known to have a wide distribution in parts of Asia and Africa (IIE, 1997).

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This pest occurs in most tropical areas of the world, including Asia, the Middle East, Africa, Australia, and Oceania. The PHM arrived in Egypt from India in 1912 and in Hawaii in 1984. It appeared in Grenada, Trinidad, and St. Kitts in the 1990's and has spread to other islands in the Caribbean, where it attacks many hosts of economic importance (USDA-APHIS, 2002).

Our field observations showed that almost all guava trees were infested in all areas in which guava trees are grown in Jordan. The pest attacks leaves (**Fig. 4**), fruits (**Fig. 5**) and twigs.

Several natural enemies were seen associated with this mealybug; the green lace wing *Crypsoperla carnea* (*Chrysopidae, Neuroptera*), *Coccinella septempunctata* L. (*Coccinellidae, Coleoptera*) (**Fig. 6**), and a tiny wasp which may belong to *Encyrtidae* (*Hymenoptera*). A research program was recently initiated by researchers of the National Center for Agricultural Research and Extension to study this pest and its natural enemies.

## References

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## Figures





**Fig. 2** - Adults and nymphs of *Maconellicoccus hirsutus*.



**Fig. 3** - Eggs of *Maconellicoccus hirsutus* on Guava fruits.



**Fig. 4** - *Maconellicoccus hirsutus* on underside of Guava leaves.



**Fig. 5** - *Maconellicoccus hirsutus* on Guava fruits.



**Fig. 6** - *Coccinella septempunctata* associated with leaves infested with *Maconellicoccus hirsutus*.

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## Announcement

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Priamus of the Cesa, vol. 12 part 6 was published on 19 March 2010. It may also be freely obtainable as **pdf** files from the following URL address:

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